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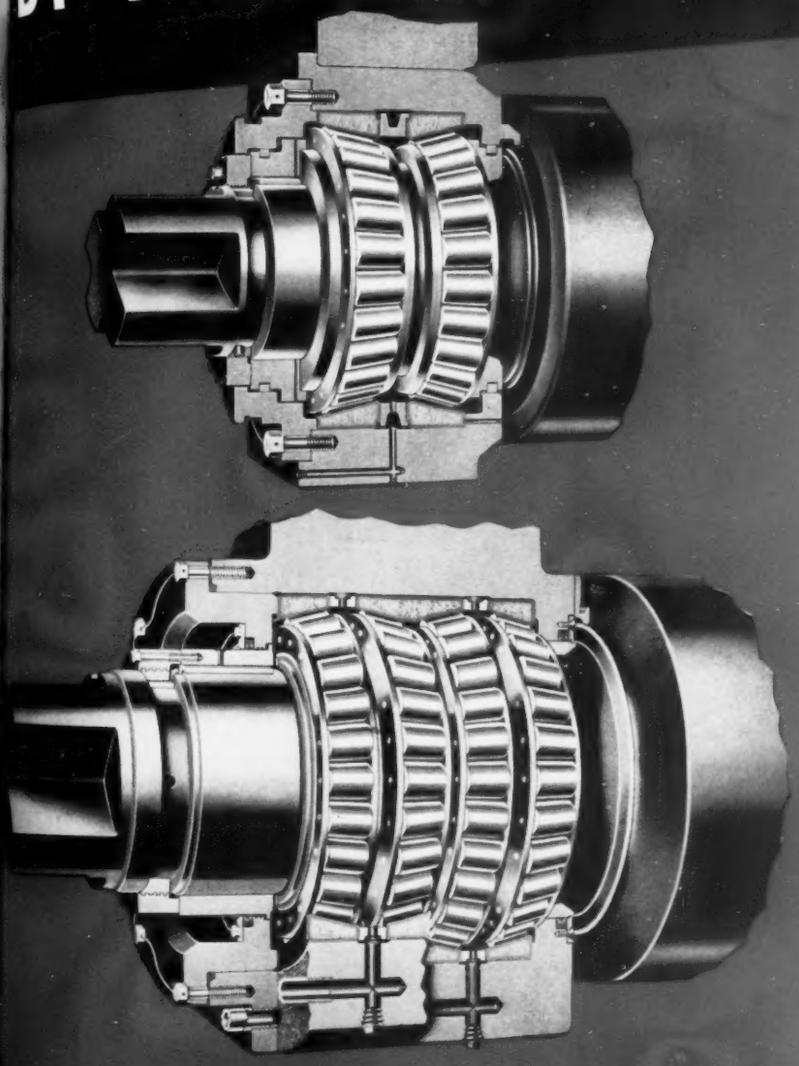

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STEEL

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For forty-eight years—IRON TRADE REVIEW

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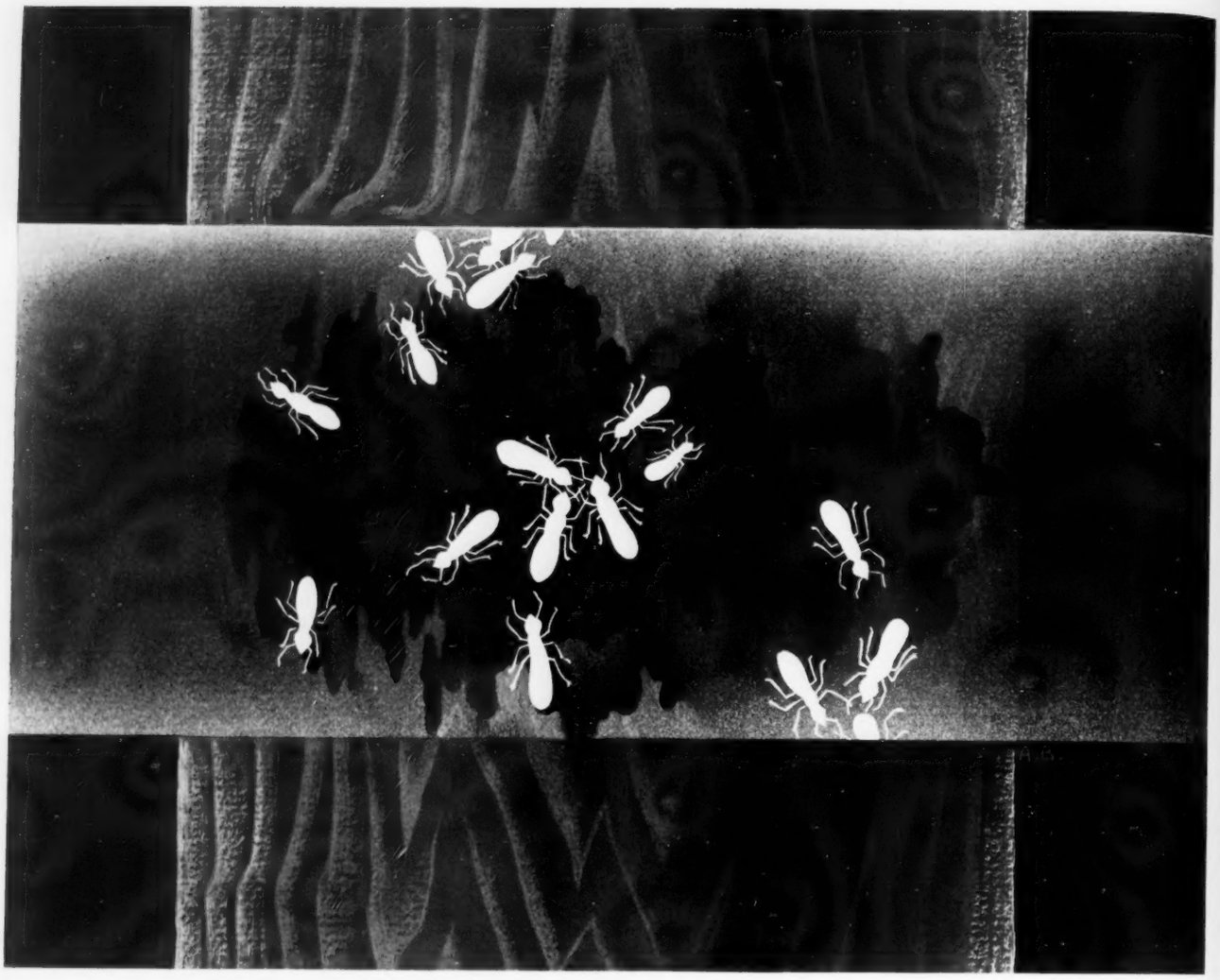

Invisible destroyers

TERMITES work stealthily — in the dark. That they may be unobserved and unmolested, their attacks on, say, a wooden support are confined to its interior. Left standing is a thin outer shell. . . . And, often, not until things collapse is the slow, insidious destruction brought to light.

Among the "termites" that lurk in the very foundations of many industrial organizations are such invisible forces of reaction as "standard practices," "established methods," "acceptable formulæ" and "satisfactory materials." Unmindful of their portent, a business may move along complacently — until, suddenly, it finds that an alert competition has captured the market because it discovered means of decidedly improving the quality of its product and reducing the manufacturing cost as well.

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As the Editor Views the News

ATTITUDES of the federal government toward several problems affecting industry's interest were clarified somewhat in four episodes of the past week. Secretary of Interior Ickes announced a more definite policy on the use of foreign steel on public works projects. Secretary of Agriculture Wallace issued a ridiculous statement that "the pig iron reduction control of big steel companies in 1933 was in principle one thousand times as damnable as the pig reduction of 1933." Secretary of Commerce Roper declared that the "breathing spell promised by President Roosevelt will be permanent. A federal judge in Louisville ruled that the Guffey coal industry control act is constitutional.

• • •

Important or trivial as they may be, each of the four events reflects a phase of the prevailing attitude of government toward industry.

Roper, Reliable Reassurer

In the silly remarks of Secretary Wallace (p. 14),, one sees the absurd lengths to which an emotional but sincere agriculturist will go to vent his hate against industry in order to justify his own acts. In the soothing words of Secretary Roper (p. 23) one senses an almost triumphant note by a man who has devoted much of his time in office to assuring industry that the Roosevelt bark is worse than the bite. Roper —the Reliable Roosevelt Reassurer!

• • •

The Ickes pronouncement (p. 14) was provoked by the purchase of German steel piling on the Triborough bridge job. Apparently the most effective protests were those launched by the Amalgamated Association of Iron, Steel and Tin Workers and by President William Green of A. F. of L. Would Secretary Ickes have acted as promptly if the same protests had emanated from American steel producers? As it was, the administrator of PWA promised that no more foreign steel will be permitted on PWA work unless he approves its use. His approval will depend on two tests: (1) is the foreign steel "dumped" steel? and (2) are the American bids collusive or unreasonable? This promise has the merit of concentrating the responsibility in one place, but it also raises the question as to whether Mr. Ickes, in the light of past performance, can rule on "collusion" and "reasonable" without prejudice.

Collusive, Unreasonable?

• • •

The ruling on the Guffey act (p. 18) tends to add to the confusion of government, industry and the public on the merit of the NIRA idea.

Good for One, Bad for All?

Essentially, the Guffey act is to the coal industry what NIRA was to all industry. But while a very substantial portion of the coal producers favor the Guffey plan, there seems to be a growing opposition throughout industry generally (p. 23) to reviving NIRA in any form. . . . Within six weeks the payrolls of all employers of eight or more persons will be subject to a federal excise tax under the federal social security act. Employers are advised (pp. 17, 27) to inform themselves fully of the implications of the act and to prepare now for Jan. 1.

• • •

Representatives of 13 foundry equipment manufacturers, each allotted 6 minutes, Thursday described the salient points of new equipment to foundrymen of northeastern Ohio. The novel idea (p. 19) clicked; it deserves trial on a broader scale. . . .

Progress in Many Fields

Plastic materials are gaining favor steadily. The growth of the industry is stimulating increased attention to the problem (p. 30) of selecting the proper steels for molding dies. . . . Open steel grid decks for highway bridges (p. 33), tested experimentally in Seattle for 30 months, seem to have proved practical and satisfactory. . . . The International Acetylene association, in its successful thirty-sixth annual convention in Cleveland, reflected marked progress (p. 16) in the application of the acetylene process. Record-breaking attendance at some sessions evidenced the current high interest in problems of welding and cutting.

E. L. Shaner

Ickes Yields, Giving American Steel Preference by PWA

No foreign materials may be purchased for federal or nonfederal projects, for which the government supplies all or part of the cost, without the approval of the administrator of public works. Contractors and subcontractors have no authority in this matter.

In event foreign bidders are low the administrator will decide: (1) Are foreign bids low by reason of a bounty or foreign exchange regulations which are unfair to American producers, and (2) Are the American bids collusive or unreasonably high?

—PWA Director Ickes

PUBLIC Works Director Ickes last week bowed to a storm of public protest, principally from organized labor, over the use of foreign steel in public works projects designed to alleviate unemployment, and for all practical purposes pledged himself to the use of domestic steel.

Over similar issues in the past Mr. Ickes has been captious toward the iron and steel industry, and a modification of PWA regulations some months ago giving domestic steel unqualified preference up to 15 per cent over the foreign product was his maximum concession.

Accedes, But Retains "Out"

But last week William Green, president of the American Federation of Labor, and the Amalgamated Association of Iron, Steel and Tin Workers addressed blistering remonstrances to him, and Mr. Ickes capitulated.

However, intransigeant to the end, Mr. Ickes announced his intention of turning over to the federal trade commission the identical bids received on sheet piling for a North Carolina project and asking it to investigate. Notwithstanding the critical attitude of FTC toward the steel industry, Washington was disposed to regard this fulmination as an "out" for the administrator.

At the end of last week, at the conclusion of a week of heated charges and rejoinders, it appeared that in the future the government policy toward the use of foreign steel, and for that matter all other construction materials, would be substantially that stated at the introduction to this article.

There appeared, however, no prospect of reversing the order for 1500 tons of German sheet piling for an ocean terminal at Morehead City, N. C., and about 650 tons of the same material for the Triborough bridge in New York. It was these two jobs that stirred up the hornet's nest.

The contract for the 1500 tons of piling at Morehead City was let to T. A. Loring & Co., Goldsboro, N. C., and the complete price using German piling was $349,449, and using American steel $373,749.

On German piling the Kloeckner Steel Co., New York, bid $42.80 per ton delivered on barges, $45.30 delivered on cars. The four domestic bids, which were identical and aroused Mr. Ickes' ire, were from the Carnegie, Bethlehem, Inland and Jones & Laughlin companies; their bids were: Not welded, on cars, $55 per ton; welded in pairs, $65; corner piling, $70; keys, $85.

It is pointed out that the all-rail freight rate from Pittsburgh to Morehead City is approximately $12 per ton, while the water rate from Germany is $2 to $3 per ton. The claim is made that piling is shipped to the United States as ballast.

In any event, after the bids were opened Oct. 1 and there was much bandying back and forth between Washington and North Carolina, the use of German piling was decided upon and, so far as is known, no further action will be taken.

Following closely upon this buy of German steel for Morehead City and culminating the issue was the action of the Woodcrest Construction Co., New York, general contractor on the Triborough bridge job, in undertaking to buy German piling, also from the Kloeckner company. No specific figure has been issued in regard to the price of German material here, but according to Mr. Ickes it was 47 per cent less than the domestic price.

When the Triborough bridge authority put the responsibility up to PWA headquarters in Washington, Mr. Ickes retorted that it was passing the buck to him, but on Thursday on issuing the revised PWA regulations favoring domestic material Mr. Ickes softened his attack, but nevertheless indicated that he would not interfere with the award.

By some it is believed that the issue of German steel was raised more loudly in New York than in North Carolina because the former is the center of anti-Nazi sentiment in this country.

Green's Protest Registers

In any event, action followed when Mr. Green protested in behalf of organized labor and pointed out the incongruity of taxpayers raising enormous funds to ameliorate unemployment, and part of these funds being utilized to provide unemployment for foreign labor—especially foreign steel labor which is paid about 29 cents per hour, compared with a common labor rate of 44 cents in the United States and an average of over 60 cents considering skilled and unskilled labor. Mr. Green's letter follows:

"Inasmuch as congress appropriated the funds for public works projects in order to relieve unemployment and alleviate widespread distress in the United States it is difficult for labor to understand how said funds could be used for the purpose of buying material manufactured in Germany. Such action seems contradictory to the aims and pur-

Pigs Not Always Pigs, as Deadly Parallel Shows

The Charge

By Secretary of Agriculture Wallace over the radio Nov. 12

"The pig iron reduction control of the big steel companies in 1933 *was in principle a thousand times as damnable as the pig reduction campaign of* 1933. *Farmers in* 1933 *and* 1934 *reduced pig production by* 3 *per cent when steel companies cut pig iron production by* 80 *per cent. That sort of industrial reduction is responsible for millions of idle and the billions spent to keep the plowed-out workers from starvation. I hope industry in future reduction programs will not find it desirable to plow millions of workers out of their jobs. People are more important than pigs. Great corporations should not finance attacks on agricultural adjustment; they are too vulnerable."*

The Fact

By the magazine STEEL and the American Iron and Steel institute

Coke pig iron output in 1933 *was* 13,221,707 *tons,* 52 *per cent over* 1932. *In* 1934 *it was* 15,977,679 *tons, or* 20 *per cent more than in* 1933. *No "damnable" reduction here!*

Says the Institute: "If Mr. Wallace meant to compare iron output with 1929 *it is true the level is much lower, partly due to lack of demand and partly due to failure of Washington to stem imports of foreign iron, which in* 1933 *exceeded* 1929. *Reduced output of pig iron is not to be compared with wholesale slaughter of pigs when millions of people were going hungry. Reduced iron output does not destroy production facilities . . . when pigs are killed the nation's food supply is affected for a long time."*

poses of the public works relief measure.

"Public works relief funds spent for the purchase of material manufactured in Germany would serve to create employment for German workers, while American working men who are thoroughly qualified and are seeking an opportunity to produce the same material are idle.

"American labor contends that PWA funds appropriated for relief purposes by the act of congress should be used for the purpose of creating work opportunities for the millions of American working men who are idle and who have been idle for more than five years.

"Intense feeling is being aroused among the working people throughout the nation through the publication of reports that the contract for steel to be used in the construcion of the Triborough bridge in New York will be awarded to German steel manufacturers."

The President slid out of the situation easily Friday when he denied that PWA policy was being changed because it never had intended to use foreign steel. He indicated a probe of dumping of alien steel might be instituted, and that the differential for domestic steel might be raised to 25 per cent. No foreign steel will be bought if it is subsidized, he said.

Chairman Davis of FTC had not received from Mr. Ickes up to late Friday any request for an investigation of collusion in bidding by domestic steelmakers.

Acetylene Industry Discusses Its Progress and Problems

LIBERAL attendance greeted the thirty-sixth annual convention of the International Acetylene association, held at Cleveland, Nov. 12-15, inclusive. The discussions reflected notable progress in the application of the oxy acetylene process, particularly in cutting and welding the recently developed low alloy, high tensile steels.

Principal subjects discussed were safety, the trend of legislation affecting the industry, the metallurgy of welding and cutting, piping and pressure vessels, the use of the oxy acetylene process in the transportation industries and the growing importance of the chemical uses of acetylene. Other features were a carefully prepared welding and cutting forum and a 4-act drama unfolding the profit making possibilities of the oxy acetylene process.

An increasing danger to the oxy acetylene industry, according to several nationally known speakers, is the increasing occurence of litigation in which workers claim compensation because of alleged damage to their eyes or to their health. Their contention was that such hazards are eliminated or minimized when the well-known and recommended safeguards are employed. They warned, however, of a tendency toward "racketeering."

"Whether the hazards in the use of the oxy acetylene process are real or legal is of small moment," said W. P. Yant, supervising engineer, United States bureau of mines, Pittsburgh experiment station. "The bringing of damage suits is approaching the racketeering state. Anyone who has followed the silicosis racket is aware of the chances for getting recovery under the law.

"Rightly or wrongly, your industry is on the spot in the matter of irritating gases generated by the application of the process. These irritating gases, if breathed, prevent normal transference of oxygen through the membranes of the lungs. But the problem of preventing injury to the men is much easier in your industry than in many others. You can prevent trouble by insisting on the use of the proper respirators. And you will benefit in the future and minimize the extent of this racketeering by developing more information as to the effects of the gases developed in the application of the process."

Follow Safety Precautions

"This is a very real danger," said H. S. Smith, chairman of the association's executive committee. "Even if you prove that the man's health has not been damaged by the oxy acetylene process a jury usually shows an inclination to give the man something. Keep yourselves immune from such litigation by following all the precautions that should be observed with the oxy acetylene process. Both respirators and ventilation should be employed to prevent fumes from being inhaled by the men. Insist on the use of goggles which comply with the goggle specifications. Do not experiment or take chances.

"Recently there was a case where oxygen was liberated to assist the breathing of men doing a welding job in a confined space; such procedure is apt to saturate the men's clothing with oxygen and make them candidates for a bonfire if a live spark strikes them. Full observation of established and recommended procedure will prevent much trouble."

Mr. Smith also spoke on the efforts in various states to adopt laws which would prove detrimental to the oxy

A New Deal Inconsistency

Iron and scrap dealers find it difficult to understand why Washington discourages shipments to Italy of any materials that might be used for war purposes, though scrap is not specifically embargoed, while sanctioning foreign steel on PWA projects. To discourage exports and encourage imports reverses the usual trend. This policy also is a double thrust at labor, costing jobs of men employed in preparing scrap and those in steel mills. Above is shown a steamer loading scrap at Newark, N. J. Secretary of State Hull Friday again warned exporters of scrap that such shipments violate this country's neutrality. Acme photo

acetylene as well as other industries. Perhaps the most serious of these have been attempts to provide for state licensing of welders and to limit the number of welding apprentices. The effect would be, he said, to place responsibility on the welders and on the states, thus preventing the welding shop managements from undertaking full responsibility for their work. In some states there have been threats of unwarranted tax burdens, such as placing a tax of up to a mill on each kilowatt hour of power consumed. A number of states sought to prohibit truck travel on the public highways from Saturday midnight to Sunday midnight. Fortunately, he said, no really damaging legislation was adopted. Nevertheless, the disposition shown will have to be watched.

Mr. Smith reported a growing adoption by insurance companies and other responsible bodies of rules and procedure promulgated by the association. He reported wide recognition of the code covering construction of underground, oil storage tanks. Efforts are being made to have the recently promulgated pressure pipe line code adopted by the various states. A code now is being prepared to cover the construction of oil storage tanks located above ground.

Recommends Public Reports

Dr. Frank S. Rossiter, surgeon, Carrie furnaces, Carnegie-Illinois Steel Corp., Pittsburgh, reported that in 26 years in the steel industry he has followed carefully the progress of the acetylene industry. He never heard of a case where workmen complained from ill effects from the process, with the single exception that some of them suffered headaches after cutting galvanized steel. He recommended careful observance of all recommended safety practices.

The acetylene industry continues young and vigorous and has made great progress during the past year, said Philip Kearny, retiring president, in his opening address. He emphasized the extent to which the association helps its members, its customers and the general public, by promoting an appreciation of the advantages of the oxy acetylene process and by compiling and making generally available reliable data on the process. He spoke of the progress in making the process safe, and in having the various safeguards written into law. Mr. Kearny thought that the association's present policy of investigating and reporting on all accidents occurring with the use of the oxy acetylene process should be revised to the extent of making such reports available to the public.

The extent to which acetylene is being used and will continue to be used as a raw material in the chemical industries depends upon its cost in relation to the selling prices of the products made from it and the volume of sales of these products, said A. F. G. Cadenhead, director of plant research, Shawinigan Chemicals Ltd., Shawinigan Falls, Que. Alluding to various proposed methods of producing acetylene, Mr. Cadenhead expressed the belief that carbide continues the cheapest source of acetylene gas at the present time, but the possibilities with other sources must not be ignored.

At the annual luncheon and business meeting Thursday noon, A. F. Stiglmeir, secretary, Master Boiler association, New York, extended an invitation to the International Acetylene association to have representation on the fusion welding committee of the Master Boiler association for 1936 which was accepted.

The distinction of honorary member of the International Acetylene association was conveyed upon A. B. Harrower, representative of the permanent international committee of Geneva, Switzerland, and W. S. Topping, chief, bureau of explosives, Washington.

A large attendance of Americans is desired at the twelfth international congress of acetylene welding and

(*Please turn to Page* 40)

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Sees Foundry Use Of Scrap Mounting

INCREASING use of scrap in the foundry in the next few years was predicted by Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel Inc., at a meeting of the Chicago chapter of the American Foundrymen's association Nov. 11.

Approximately 4,000,000 tons of scrap was consumed by the foundry industry in 1929. The machinery replacement market alone, estimated at $18,000,000,000, creates great opportunities for foundries and scrap dealers, Mr. Schwartz pointed out.

The competitive drive for scrap materials, he said, has been complicated by the fact that many steel mills are using large tonnages of cast scrap, which formerly were considered the domain of the foundry, while foundries have invaded scrap piles available for steel mills, by learning to use steel scrap in their cupolas.

The presence of alloys has created the problem of careful segregation of scrap. Railroads are no longer the leading source of scrap supply, in view of the rise of the automobile and the container industries as leading users of steel, with resulting changes in the type of scrap that is available for foundries and mills.

The answer to proper specifications of foundry scrap is in the selection of a responsible scrap dealer, according to Mr. Schwartz. What a foundry buys in its scrap is not specifications but the element of service, integrity, and confidence of a reliable dealer. The prejudice against scrap in the foundry was criticized by Mr. Schwartz as unwarranted.

Form New Galvanizing Body

American Hot Dip Galvanizers' Association Inc., American Bank building, Pittsburgh, is taking steps to incorporate as a national non-profit corporation, replacing the former Galvanizers' association, which was disbanded Oct. 31 through action of the latter's executive committee.

Car Builders to Merge?

American Car & Foundry Co., New York, was reported last Friday having under discussion acquisition of the Ryan Car Co., Chicago; the Mt. Vernon Car & Mfg. Co., Mt. Vernon, Ill.; and the Bettendorf Co., Bettendorf, Iowa. All are builders of railroad cars and equipment. The merger might involve over $15,000,000.

Trade Bodies Should Draft Social Security Bill

BY H. W. STORY

AS YOUR chairman (chairman of the Farm Equipment institute's meeting, Chicago, Oct. 10) has indicated, I have accepted the assignment of explaining to you the immediate problem of the employer under the federal social security act.

If I cared to be facetious I might open and close my talk with the statement that the immediate problem of the employer is to raise the money to pay the taxes imposed by the act. But since I expect American business to take this financial hurdle in its stride, I shall attempt to point out the very real and immediate problem, which has nothing to do with the amount of the financial burden of the act.

My remarks will be confined to the employers' problem under Title IX of the act which, because it tends to stimulate the establishment of state unemployment compensation systems, has been inaccurately referred to as the federal unemployment insurance system.

In order to make the problem as simple as possible, I shall deliberately omit all reference to details of the act which do not, in my opinion, have a real bearing on the problem.

How Far Does Act Go?

The scope of Title IX of the act can most readily be understood by answering the following three questions, namely,

1. Does the act establish a federal unemployment system; or does it merely levy a new kind of tax?
2. Can an employer obtain credit against the federal tax?
3. Can an employer obtain full credit against the federal tax without making any current contribution?

As to the first question. The act does not set up a federal unemployment compensation system; but, on the other hand, it does (as its heading indicates) impose a "tax on employers of eight or more."

The tax is imposed by the following brief and simple language (in section 901) as follows:

"On and after Jan. 1, 1936, every employer (as defined in section 907) shall pay for each calendar year an excise tax, with respect to having individuals in his employ, equal to the following percentages of the total wages (as defined in section 907) payable by him (regardless of the time of payment) with respect to employment (as defined in section 907) during such calendar year:

(1) With respect to employment during the calendar year 1936 rate shall be 1 per cent;

(2) With respect to employment during the calendar year 1937 the rate shall be 2 per cent;

(3) With respect to employment after Dec. 31, 1937, the rate shall be 3 per cent."

Another illuminating provision of the act (section 905 [a]) reads as follows:

"The tax imposed by this title shall be collected by the bureau of internal revenue under the direction of the secretary of the treasury and shall be paid into the Treasury of the United States **as internal revenue collections.**"

H. W. Story
Vice president and general attorney, Allis-Chalmers Mfg. Co., Milwaukee, whose paper, presented herewith, was given Oct. 10 before the Farm Equipment institute, Chicago

As there is no provision in the act which appropriates the taxes for any specific purpose, it is quite obvious that the act creates a new kind of excise tax, namely, a tax on payrolls which, upon collection, will go into the general fund of the United States treasury and, accordingly, may be used for any purpose which congress may dictate—even balancing the budget.

Thus, it is quite clear that the act is in form and essence a tax measure.

This brings us to the second question, namely, whether it is possible for an employer subject to the act to obtain a credit against this payroll tax. The answer to this question is "yes."

The act clearly provides that an employer may obtain credit, up to 90 per cent of his total tax, in the amount of his contributions with respect to employment during the taxable year paid by him into an unemployment fund under a state law which meets certain criteria set forth in the act.

And now the third question, namely, whether an employer can obtain full credit, up to 90 per cent of the federal tax, without making any current contribution to a fund under a state unemployment compensation law. The answer to this question is "yes."

Due to the influence of the proponents of the Wisconsin unemployment compensation law, the act contains a provision to the effect that when, and so long as, an employer under a company reserve state system, maintains in his reserve account an amount equal to 7½ per cent of his total payroll for the preceding calendar year, full credit against the federal tax will be allowed.

Takes Time To Build Reserve

Obviously, this provision is not of any immediate benefit to employers because every employer will be obliged to make contributions under state systems for at least four years —even if no benefits are paid during that period—in order to build up a reserve to the level of 7½ per cent of his payroll. Nevertheless, this provision is extremely important from both social and economic standpoints, particularly because it is a vital part of the company reserve system.

Thus, simply stated, the act provides for (1) a new kind of tax based upon payroll; (2) credit against the tax in the amount of contributions made by an employer under an approved state system; and (3) full credit, under certain circumstances, even without any contribution by an employer under his state system.

In its psychological effect, the act will not operate as a tax measure because the normal reaction of the employer will be to prefer to make contributions under a state unemployment system which will definitely benefit his employes rather than to pay taxes into the federal treasury without *any* assurance that they will be returned to the state.

Accordingly, it is reasonable to expect that employers will actively urge the adoption of an "approved" state system and because of this probable effect I have dubbed the act "A State Unemployment Compensation Stimulus Plan."

In any event, there are three

courses of action open to an employer subject to the act, namely: (1) to retain counsel to test the constitutionality of the act; (2) to retain counsel to test the constitutionality but at the same time to draft and urge the passage of a bill for the establishment of a constructive state system to become effective only upon final decision of the Supreme Court declaring the federal act to be constitutional; and (3) if the employer happens to favor the establishment of an unemployment compensation system as a proper adjunct of our capitalistic system, then to select and urge the establishment of a sound state system.

It is rather inconceivable that any successful industrial employer, with the intelligence he must have had to be successful in his business, will follow the example of the ostrich by electing merely to contest the constitutionality of the act. Hence it is reasonable to suppose that employers will desire to follow either the second or third alternative. In that event, it will be necessary to select the type of state unemployment compensation law for state establishment.

Before selecting a system for state adoption, it is necessary to determine what restrictive criteria are set up in the act which may limit the scope of a state system.

The act (section 303 [a]) provides that the federal social security board *must* approve every state law which provides that:

1. All compensation shall be paid through public employment offices in the state or such other agencies as the board may approve;

2. No compensation shall be paid during the first two years of the operation of the state law—in other words, there must be an accumulation period of two years before payment of benefits;

3. All contributions made by employers to a fund under the state law must be paid over to the secretary of the treasury to be put into the federal unemployment trust fund;

4. All money paid out of the federal unemployment trust fund to the state agency shall be used solely in the payment of compensation and, thus, not used to defray expenses of administration of the state law;

5. Compensation shall not be denied to an unemployed for refusing to accept new work under the following conditions:

(a) If position offered is vacant due directly to a strike, lockout, or other labor dispute;

(b) If wages, hours, or other conditions of the work offered are substantially less favorable to the individual than those prevailing for similar work in the locality; and

(c) If the condition of being employed by the individual would be required to join a company union or to resign from or refrain from joining a bona fide labor organization.

Two General Systems

Although some of the foregoing requirements may be somewhat irritating to the employer, nevertheless, it is obvious that wide latitude is left to each state in the selection of the type and scope of unemployment compensation system it may desire to establish.

Next comes the question of the selection of type of unemployment compensation system.

There are only two fundamentally contrasting types of unemployment compensation systems—the English pooled fund and the Wisconsin company reserve.

Under a pooled fund system the employers' contributions are placed in one fund owned by the state. No contributing employer has a vested interest in the fund. Benefits are payable from the fund on a first-come first-served basis to all of the unemployed of the state subject to such

(*Please turn to Page 91*)

Priceless Federal Records To Repose On 75 Miles of Steel Shelving

AFTER a century and a quarter of agitation, involving the introduction of 69 bills in congress, the records of the United States government are at last to be placed in a permanent home in the recently-completed $10,000,000 Archives building in Washington.

Approximately half of the building's 8,700,000 cubic feet will be filled with an intricate system of metal stacks, shelves and drawers. Installation of the first unit of stacks, representing from an eighth to a tenth of the present building's requirements, is just being completed by the Berger Mfg. Co., Canton, O., a division of Republic Steel Corp.

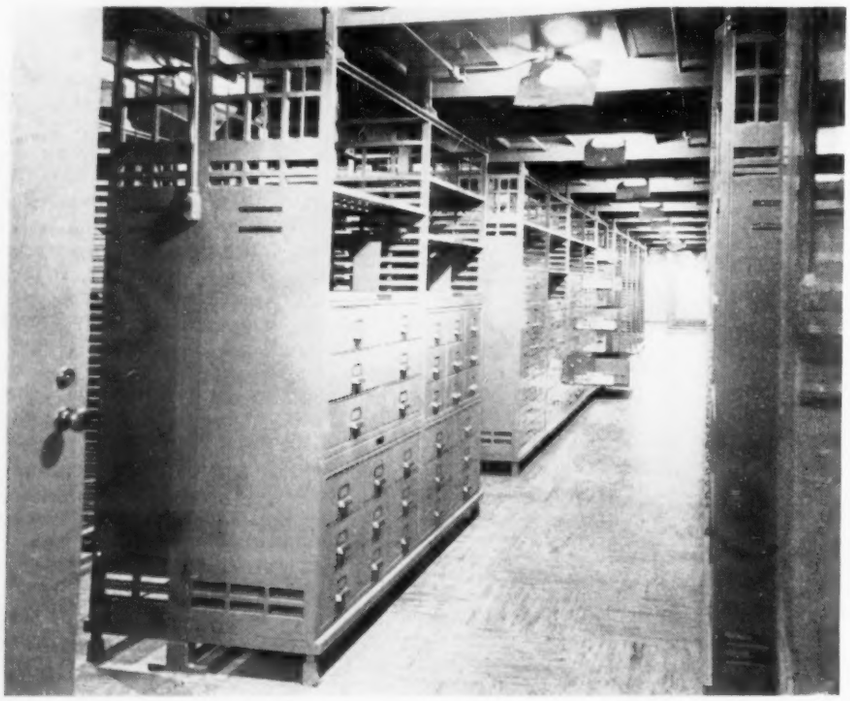
The total shipments amounted to about 1200 tons of finished material and filled 66 freight cars. Laid end to end, the finished cases and uprights would reach 75 miles. It took Berger four months to fabricate the material, according to L. S. Hamaker, vice president and general manager.

The stacks, all specially designed and representing the most modern ideas for this type of equipment, are divided into 130 zones, with 10 zones under the control of a section chief.

The material to be filed will include official records of the United States, treaties, laws, executive orders, proclamations, commissions, dispatches, instructions to diplomatic officials, general correspondence, land office records, records of Indian affairs, territorial papers, military and naval records, etc.

An innovation is facilities for storing sound motion pictures which are illustrative of events in United States history.

The building, which is roughly in the form of a hollow square, has a center well which can be roofed over, and will contain an additional 3,300,000 cubic feet of space.



Financial

A. M. BYERS CO. and subsidiaries, Pittsburgh, report net loss of $210,442 for the third quarter, compared with loss of $272,025 in the preceding quarter and loss of $258,157 in the third quarter of 1934. For the fiscal year ended Sept. 30, net loss was $900,546, against net loss of $773,748 in the preceding fiscal year.

STEEL FOUNDRIES HAS LOSS

American Steel Foundries, Chicago, reports for the nine months ended Sept. 30 a net loss of $313,141, after depreciation, federal taxes, etc., compared with a net profit of $431,401 in the first nine months of last year.

Steel in the News

A LONDON metallurgist named John Tann is credited in news dispatches with having invented a steel that is impregnable and unsinkable. It is claimed that tests which reduced armor plate to a semi-molten state in 17 seconds had not effected this new steel in 40 minutes —whatever bearing that may have on the qualities of impregnability and unsinkability.

STAINLESS AFTER WEARING?

Sheffield manufacturers of stainless steel are manufacturing ties and socks for men from this material, according to *Industrial Britain*. However, no details are given.

Foundry Equipment Makers Explain New Products

About 200 attended the session of the northeastern Ohio chapter of the American Foundrymen's association in Cleveland, Thursday night, when the meeting was turned over to manufacturers of foundry equipment. On the program, and their topics were:

"Shakeout Vibrators," by W. E. Naylor, chief engineer, Beardsley & Piper Co., Chicago.

"Recent Molding Machine Developments," by Leon F. Miller, sales engineer, Osborn Mfg. Co., Cleveland.

"Recent Developments on Simpson Sand Mixer," by W. C. Packard, assistant sales manager, National Engineering Co., Chicago.

"The Wheelabrator," by J. D. Alexander, Cleveland representative, American Foundry Equipment Co., Mishawaka, Ind.

"Sand Testing Equipment," by H. W. Dietert, president, Harry W. Dietert Co., Detroit.

"The New Pangborn Airless Rotoblast Cleaning Barrel", and "The Pangborn Norbide Long Wear Blast Nozzle," by P. J. Potter, vice president, Pangborn Corp., Hagerstown, Md.

"Metal Abrasive in Cleaning Castings," by O. C. Sabin, secretary, Steelblast Abrasives Co., Cleveland.

"Sly Master Blast Mill," by F. A. Ebeling, sales manager, W. W. Sly Mfg. Co., Cleveland.

"Brackelsberg Furnace," by M. F. Becker, sales engineer, Whiting Corp., Harvey, Ill.

"Abrasive Cutoff Machine," by Leicester S. Lewis, vice president, Tabor Mfg. Co., Philadelphia.

"Cooling Molding Sand," by H. L. McKinnon, secretary, C. O. Bartlett & Snow Co., Cleveland.

"Covered and Insulated Ladles," by W. J. Knappe, sales manager, Modern Equipment Co., Port Washington, Wis.

Coal NRA, Upheld in Lower Court, May Be Danger Signal to Iron and Steel

IN ADDITION to the apparent attempt of Maj. George L. Berry, co-ordinator for industrial co-operation, to rehabilitate NRA through his Dec. 9 conference in Washington (p. 23) another threat of NRA presented itself to the iron and steel industry last week through a favorable court decision on the Guffey act, creating an NRA for the bituminous coal industry.

Federal Judge Elwood Hamilton, at Louisville, Ky., upheld the constitutionality of the Guffey law. In his ruling he declared: (1) Where facts supported it, the declaration of congress that an industry affects interstate commerce is conclusive in court unless the courts judicially know the contrary, and congress may legislate concerning such an industry; (2) Coal mining affects interstate commerce and is a business affecting the public welfare; (3) Congress may use its taxing power to regulate hours, wages, and prices in industry; and (4) The national government must undertake to regulate commerce because states cannot.

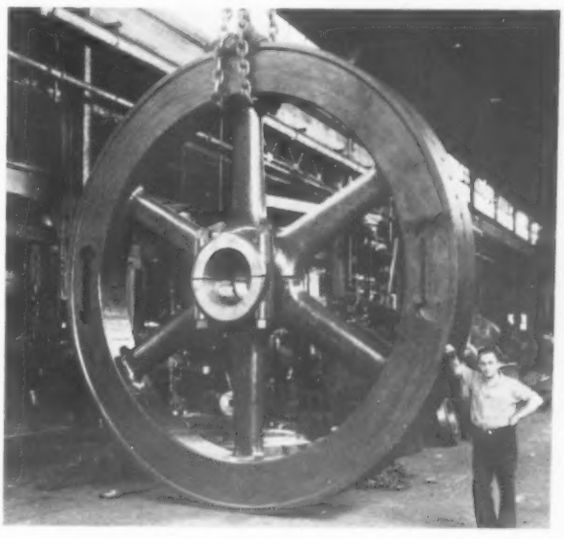
In many ways iron and steel could be substituted for bituminous coal in such a conclusion. Judge Hamilton's decision, of course, is only the start of the legal fight to ascertain the limits to which federal regulation can go. It is interesting to note that the Guffey bill was re-drafted and passed after the Supreme Court decision of last May invalidating the national recovery act.

For another thing, so drastic are the provisions of the Guffey law that there is some opinion that the government cannot buy steel products unless the producer certifies that the coal consumed by him in manufacturing this steel originated in mines operating under the bituminous coal NRA.

In the Guffey act it is specifically stated that government mail contracts cannot be held by railroads purchasing their coal from companies not complying with the law. H. T. Hunt, acting general counsel for the bituminous coal commission, has interpreted the law to mean that any firm or individual contracting to supply material to the government will have to purchase coal from mines complying with the law. This is purely informal.

The status of "captive mines" which supply fuel for most iron and steel producers has not been settled, as the act grants the commission wide latitude in determining their adherence to Guffey standards.

One Wheel of Industry



This 14-foot flywheel was built for a 1350-horsepower, 24 x 36-inch tandem gas engine for the Owens-Illinois Glass Co., for installation at its plant in Kanawha City, W. Va., recently. The engine weighs 400,000 pounds. Ben Paulson, dean of erecting engineers of the Cooper-Bessemer Corp., Mt. Vernon, O., is showing with the flywheel in the Cooper-Bessemer plant, where the unit was built

Production

STEELMAKING was pulled back 1 point last week to 52 per cent, due chiefly to a drastic reduction in operating schedules at Youngstown, which more than offset gains in the Chicago, Cleveland and New England districts. However, with Youngstown expected to regain part of the loss this week and Chicago probably bettering its rate, a rebound appears to be in the cards for this week. All other districts are holding steady. Further details follow:

Youngstown—Declined 10 points to 53 per cent, due to Republic Steel Corp. suspending open-hearth operations here for two or three days. It has also taken off an open-hearth furnace at its Warren, O., plant. A rebound to 56 per cent at this week's start is anticipated, with the relighting of several Republic Steel open hearths.

Pittsburgh—Unchanged at 44 per cent last week, though there is a wide disparity in ingot rates of Steel corporation subsidiaries and those of the independents. The leading interest closed at 33-34 per cent for the Pittsburgh district proper, or 40-41 per cent, including the Mahoning valley plants. The leading independent operated at an unchanged rate of 55-56 per cent through the week. Rates of the smaller independents averaged 50 per cent.

Twenty-six out of 60 steelworks blast furnaces are on, with 11 of that number in production for Carnegie-Illinois Steel Corp., 8 for Jones & Laughlin Steel Corp., 1 each for National Tube Co., American Steel & Wire Co., Pittsburgh Crucible Steel Co. and Pittsburgh Steel Co., and 3 for Bethlehem Steel Co. at Johnstown, Pa.

Detroit—Unchanged at 88 per cent last week, 15 out of 17 open-hearth furnaces being on. One producer is operating eight of nine and the second mill, seven of eight.

Wheeling—Steady at 84 per cent last week. Thirty-one out of 37 open-hearth furnaces are in production.

Birmingham—Continued at 58 per cent last week, with 13 open hearths in production. Five additional open hearths are being put in readiness, for resumption on short notice.

Cleveland-Lorain—Up 8 points to 77 per cent, Republic Steel Corp.'s Corrigan-McKinney plant lighting 2 open hearths to operate 12 of its 14 units; Otis Steel Co. adding 1 to operate all 8, and National Tube Co., Lorain, continuing with 10 of its 12 units. Otis is to drop one this week for repairs, while National Tube will add one.

New England—Advanced to 93 per cent last week, a gain of 23 points to the highest rate of the year, due to two works operating at capacity. Schedules for this week indicate this rate will hold.

Chicago—Increased 1½ points to 57 per cent, the highest rate in five weeks and only 3 points below the peak of the past nine months. A steady or higher rate is in prospect for this week. Blast furnace schedules are unchanged, with 19 of the district's 41 stacks active.

Central eastern seaboard—Held at 39 per cent, with an increase of one unit at Sparrows Point, Md., being offset by slight variations elsewhere.

Finished steel demand appears to be a shade lighter; however, prospects of higher prices on Jan. 1 should result in sufficient anticipatory buying to increase operations.

Buffalo—Unchanged at 37 per cent, and no immediate gain is in sight. Fourteen open hearths are in production.

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Nov. 16	Change	Same week 1934	Same week 1933
Pittsburgh	44	None	21	21
Chicago	57	+ 1½	31	29
Eastern Pa.	39	None	20	17½
Youngstown	53	—10	31	31
Wheeling	84	None	54	46
Cleveland	77	+ 8	38	46
Buffalo	37	None	24	32
Birmingham	58	None	25	20
New England	93	+23	40	70
Detroit	88	None	48	45
Average	52	— 1	28	28

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)

(Tons)

	1935	1934	1933	1932
Jan.	534,055	331,777	285,138	426,271
Feb.	583,137	385,500	275,929	413,001
March	668,056	588,209	256,793	388,579
April	591,728	643,009	335,321	395,091
May	598,915	745,063	455,302	338,202
June	578,108	985,337	603,937	324,746
July	547,794	369,938	701,322	272,448
Aug.	624,497	378,023	668,155	291,688
Sept.	614,933	370,306	575,161	316,019
Oct.	686,741	343,962	572,897	310,007
10 mo.	6,027,964	5,141,124	4,729,955	3,476,052
Nov.		366,119	430,358	275,594
Dec.		418,630	600,639	227,576
Yrl. adj.		19,907	44,283	5,160
Total		5,905,966	5,805,235	3,974,062

STEEL SHIPMENTS IN GOOD GAIN

Shipments of finished steel by the United States Steel Corp. in October totaled 686,741 tons, a gain of 71,808 tons over September. This is the largest volume of shipments since June, 1934, and the largest October total in four years.

Meetings

PURCHASING AGENTS' ASSOCIATION OF PITTSBURGH has planned an inspection trip through the Mesta Machine Co., West Homestead, Pa., at 3:30 p. m., Nov. 19. Following, Mesta Machine Co. will be host at a dinner to the group, after which an informal talk by John H. Vohr, superintendent of hot strip mills of Youngstown Sheet & Tube Co., Youngstown, O., will be given on hot and cold continuous rolling mills and their products.

REPUBLIC SHOWS NEW MOVIE ON STAINLESS AT CHICAGO

Republic Steel Corp. was host to about a thousand steel consumers of the Chicago district at a buffet supper at the Congress hotel, Chicago, Nov. 12. The occasion was the presentation of a motion picture filmed at the company's plants recently.

Entitled "Enduro, Republic's Perfected Stainless Steel," this picture traces the various steps in the manufacture of stainless steel, from the mining of the ore to the finishing of the sheet, strip, plate, rod or bar. In addition, it depicts typical uses for this material and the operations employed in fabricating stainless steel into various articles.

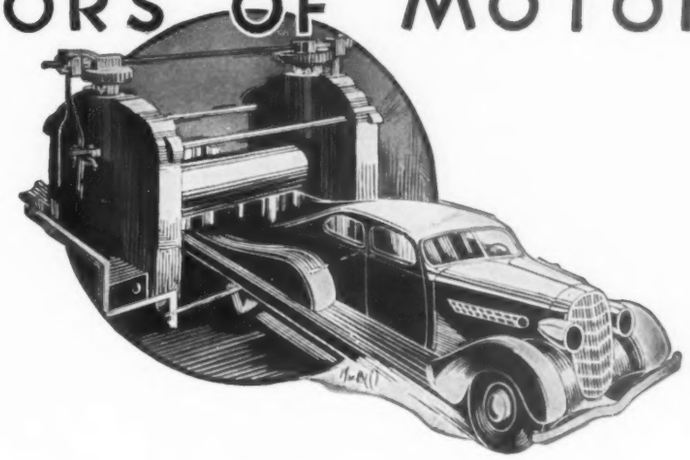
Dust Hazard Discussed at Steel Founders' Meeting

A two-day session of the Steel Founders' Society of America was held in Cleveland, Nov. 14 and 15. President A. F. Lorenz Jr., American Steel Foundries, Chicago, presided. The other officers of the association are Col. Merrill G. Baker, executive vice president, and R. L. Collier, secretary.

At the Friday morning session consideration was given to various phases of dust hazard in the foundry industry. A paper by O. E. Mount, treasurer, American Steel Foundries, Chicago, was read by Mr. Lorenz. He recounted the effort being made in Illinois to obtain fair and equitable compensation legislation covering the occupational disease hazards.

An interesting practical address on dust prevention and good housekeeping was presented by E. O. Jones, National Founders' association, Chicago. Don E. Cummings, Saranac laboratory for the study of tuberculosis, Saranac, N. Y., discussed various phases of silicosis and emphasized the point that silicosis in itself is not a disabling disease.

MIRRORS OF MOTORDOM



DETROIT

PESSIMISM—"A disposition to take a gloomy view of affairs. Cynicism. Regard for life as the worst possible world."

Thus does Webster characterize that unfortunate state of affairs. But to sell a dictionary today in Detroit would most necessarily require the deletion of that word. This city with its million and a half souls simply does not know pessimism.

Rather, the industrial strata here fairly ooze optimism. People have money to spend. The night clubs, movies, and all forms of entertainment are booming. Politics may be a favorite in passing conversation, but the depression isn't.

The automobile industry and its opening thrust to the surface in the form of the annual show gathered them in here all last week. Clearly, it was not a sightseer's show, but a buyer's exhibit.

Indicative of the trend, over 400 sales alone were made off the floor at the Detroit show in the first three days of last week. From the newsboy on the street up to the loftiest motor executive, Detroit exudes word that 1936 will be a 5,000,000-car year.

Assembly Lines To Hum

In short, it's a tonic these days to depression-frayed nerves to get an injection of this motor-mania. There are cars to be built—Detroit now is buckling down to the task.

Furthermore, there is all evidence even at this early writing that curves in production are really being flattened. A 325,000- or 350,000-car month in the industry for November doesn't overtax the lines, but it is a comfortable starter.

For example, Chevrolet and Ford each have avowed intent to hit at 100,000 assemblies apiece for this month and December. Plymouth, at 50,000 jobs each month, rounds out the industry's backbone.

In the case of each, though, parts in some volume have been and are being banked up against the inevitably better spring. Chevrolet, and in fact all General Motors, is now drawing from a 15-day "float," which is that supply of materials that is in transit from the supplier or in the warehouse bins, numbered and waiting call.

Previously, General Motors used to consider its parts bank so close that it was sufficient only for assemblies in that period (from three to four, or possibly five days at the outside) defined as the time elapsing from the shipping point to the receiving dock.

Less Pressure on Suppliers

For example, General Motors, and this case is not conspicuous but rather typical, would buy parts from an outside supplier and keep ahead only to the extent of the time it ordinarily took for the goods to be transported from the parts' supplier's plant to the General Motors' receiving room.

A 15-day bank, of course, means tying up funds, but it also means less perspiration for the supplier, less sweat for the assembly line foreman, and a degree of vulnerability from labor strikes. If you want to be humanitarian, it is also a better shake for labor.

To translate new policy into cold figures, General Motors' third-quarter report shows a $45,000,000 increase in inventories at Sept. 30 over last year. Accounts payable jumped from $21,000,000 to $45,000,000. Current assets (by transferring cash to inventory) mounted some $60,000,000 to a figure of $423,000,000. By Dec. 30, 1935, the inventory will be higher.

Such is a bold policy, but one worthy of the risk. And, confirming the times, no better harbinger of a better year ahead could be found.

Though Ford's balance sheet, as usual, is screened from the public's gaze, the same state of affairs applies. Ford has stocked, and has instructed suppliers, along similar lines. Even as far back as last July, Ford was stocking standard parts for the 1936 cars—a condition that bears fruit today.

Consequently, today finds production managers sitting around the table and being able to say with a certainty what assemblies will be a month, six weeks hence. This year, more than any of the last six, finds the confusion attendant upon introduction of a new model virtually gone.

"Tops" in the motor game aren't suffering nightmares, the men down the line aren't breaking out as they used to when they saw a small part hamstringing an entire plant. There's less blue atmosphere in Detroit today.

With a few exceptions, of course. Chrysler Corp., much more noticeably than Ford or General Motors, gave late approval to its cars, especially the Chrysler and DeSotos, and put hand-made cars into the show. Plymouth, while it banked ahead a good many thousand motor blocks, now fails to get radiator grilles through smoothly.

Send Dies by Plane

At Plymouth, the assembly forecast seems to be something around 1800 a day for some time. But, on a few days last week it was only with some stretching that that total was attained, for outside sources on grilles were finding difficulty in getting parts to fit snugly, and there was difficulty in getting fins to set vertically true.

Chrysler itself even resorted, in one case last week, to hurry-up airplaning of certain small instrument panel dies over the country to get a source of supply. As is well known by now, assemblies of the Airflow started late and the rush is to catch lost ground.

But to return to Chevrolet, that maker went into the shows for the

first time in fully a decade with the field really stocked, so that retail deliveries could be made at once. In recent years, knee-action or turret top had forced back delivery promises a month to six weeks, even longer.

In brief, the production lines by and large aren't running a fever. Chrysler's temperature for the time being may be a few degrees above normal, but all patients should be doing well in a few weeks. Ford's radiator-assembly trouble, for one, has cleared. So has the trouble over stainless steel used in the Ford hood hinge.

In fact, they should be doing so well that one maker, prominently advertising a "steel top" won't have to go into the late November shows with a fabric top show model, as it did at Detroit, nor will such as Cord, Graham, Chrysler, and few others be forced to make up any more exorbitantly expensive hand-made jobs.

Production of cars and trucks last week was 93,177 units, compared with 89,095 the week before. Those "in the know" in Detroit do not look for much further increase in view of the fact Ford and Chevrolet evidently intend to stand pat at about 166,000 units each a month for the remainder of this year.

Abandon Kicks on Prices

All of Detroit's optimism is something akin to "money from home" to the materials supplier today who is dependent on the motor industry.

For one main reason, the pressure on prices seems definitely to be off, though practically all suppliers, including steel, are shorn of the protection of NRA codes on open prices, etc.

There is a marked feeling among automotive purchasing agents of resignation to today's material prices. One doesn't hear the rumblings under the desk to "give us our parts for 10 per cent less" or rumor of "special discounts." A live-and-let-live atmosphere definitely is predominating.

In steel, for example, many of the sheet mills by last week were sold up until Christmas week for full finishes, so that delivery and not haggling over price is uppermost. What opposition, if any, is met by the impending price advance in finished steels does not appear formidable.

Well-based report in Detroit today says there will soon be an important steel mill expansion here. Great Lakes Steel Corp., a division of National Steel Corp., is seriously considering building more open-hearth capacity.

When this mill was built in 1929-1930 six 150-ton open-hearth furnaces were put in, though the original plan was for 12 eventually.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,817
Feb.	105,447	230,256	335,700
Mar.	115,272	338,434	429,834
Apr.	176,432	352,975	477,746
May	214,411	330,455	364,727
June	249,727	306,477	361,321
July	229,357	264,933	337,044
Aug.	232,855	234,811	240,051
Sept.	191,800	170,007	89,805
Oct.	134,683	131,991	*200,000
10 mo.	1,768,809	2,516,005	3,129,045
Nov.	60,683	83,482	.....
Dec.	80,565	153,624	.....
Year	1,920,057	2,753,111	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

Nov. 2	76,740
Nov. 9	89,095
Nov. 16	93,177

In fact, ground space was left so that 12 could be built.

Just before the NRA code went into effect, or in 1933, Great Lakes built two more furnaces, making eight steelmaking units there. Now, according to present plans, space along the river will be used for four more.

For one thing, the new Great Lakes wide sheet mill will be running by Jan. 15, and with finishing capacity far outstripping ingot capacity this division will need to cease the expensive practice of bringing in large tonnages of sheet bars and other semifinished steels all-rail from Weirton, W. Va., to care for some of the Detroit division needs.

430,000 Tons Added Capacity

As of last report, the eight Great Lakes open hearths could make some 920,000 tons of basic open-hearth steel annually, and existing bar, strip and sheet mills could take up 950,000 tons. But, before many more months the new continuous sheet mill will add several hundred thousand tons capacity. A battery of four more open hearths, if they are to be 150-ton capacity, would add 420,000 tons yearly and bring ingot rating to 1,380,000 tons.

Out at Chrysler, with a completely rehabilitated foundry since last month, they are becoming more casting-conscious.

At present, Chrysler research engineers are scanning the constituent parts of all of Chrysler Corp.'s four lines of cars to see where cast steel can replace rolled steel to advantage.

For one thing, Plymouth seems definitely set on a cast steel crankshaft next year. As in all other makes except Ford (including Lincoln), crankshafts are a forged steel proposition. Since 1933 Ford has been swinging gradually over to the cast idea, in 1933 using it on about half of its output, and in 1934, 1935 and for 1936 going over whole-heartedly.

Plymouth seems to have gathered from Ford's experience that the cast unit is somewhat cheaper to make and that it eliminates a twist motion peculiar to a rolled steel part when in operation at higher speeds. No great weight in saving involved in the completed motor is, but obviously the cast member involves less scrap loss and less machining.

Ford's V-8 crankshaft weighs 56.5 pounds, as used today; the Lincoln-Zephyr crankshaft weighs 80 pounds. If Plymouth continues with a six, the casting would weigh between 42 and 43 pounds.

Labor trouble which broke out several weeks ago at the Mather Spring Co. plant in Toledo edged into Detroit district Friday when the management of the Motor Products Corp. and representatives of the Mechanics Education society and the Automotive Workers Industrial association broke on the matter of a wage increase. Motor Products offered a 10 per cent increase; union spokesmen held out for 15, and Friday afternoon began calling out their members.

It was expected Friday that by this week some difficulty might be encountered at parts plants in Cleveland. Partsmakers shift work from a closed plant to an open one, and labor is determined to fight.

Treasury Grants Drawbacks On Many Steel Products

Drawback allowances have been granted by the treasury department:

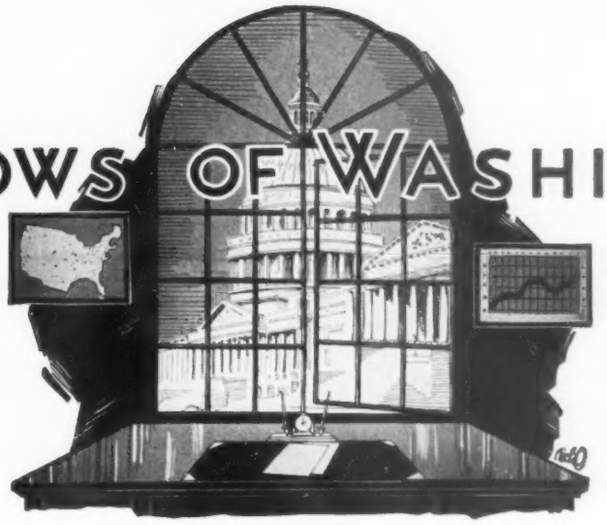
On steel products, including blooms, ingots, bars, roll, strips, etc., manufactured by Firth-Sterling Steel Co., McKeesport, Pa., with the use of ferrotungsten produced under drawback regulations.

To American Manganese Steel Co., Chicago Heights, Ill., at its several factories in the manufacture of its exported products on steel scrap containing duty-paid manganese, and chromium-nickel alloy scrap containing duty-paid nickel and chromium.

On double edge safety razor blades manufactured by the Club Razor & Blade Mfg. Corp., Newark, N. J., with the use of imported razor blade strip steel.

On steel drums manufactured by the Meurer Steel Barrel Co. Inc., Newark, with the use of imported sheet steel.

WINDOWS OF WASHINGTON



WASHINGTON

AN INCREASING amount of opposition is developing within the administration to the Berry industrial-labor conference to be held in this city beginning Dec. 9—and lasting no one knows how long.

Replies are being received daily by Major Berry's office from trade associations and individuals who have been invited to attend. No one will ever know just what the replies say because newspapermen have not been allowed to see any of them and unless they are made public by the writer they will never see the light of day if they are opposed to the conference.

While every day the press division of Major Berry's office gives out what are termed both acceptances and declinations to the invitation to send representatives, these are just "selected" by the publicity representative of Major Berry and no effort is being made to give out all of the names of those answering either for or against such a conference.

However, a number of organizations have given out copies of their letters as they have been sent to the industrial co-ordinator. Some of them have been red hot, too.

Lumber Industry Opposed

For instance, H. C. Berckes, secretary-manager of the Southern Pine association, frankly states the unequivocal opposition of the members of the southern pine industry which employs more than 100,000 men, to any revival of the NRA or a lumber code in any form. He mentions some of the industry's main reasons for this attitude and refers to measures now under way looking to self regulation by the industry and improvement of conditions affecting both employes and owners in the industry.

While Major Berry in both written and verbal remarks has first said that the conference would take up further NRA legislation and then said that it would not, Alfred Reeves, vice president of the Automobile Manufacturers association, in a letter to Major Berry says that "it is now clear to us that the only purpose of these meetings is to consider further NRA legislation or a substitute for it."

Mr. Reeves says further, in declining to attend the conference, that "this industry does not believe that a substitute for NRA will help the industry or its employes but on the contrary that it will do harm. Progress of the industry in recovery has been greater since the code terminated."

Ford Sends Regrets

Also for the first time in many moons the Ford Motor Co. seems to be in accord with the rest of the automobile industry on this question. Edsel Ford, in refusing to send a representative to the Berry conference, said, "we have not participated in such conferences in the past, and our observation of their effect upon the recovery of the nation's economic health has not convinced us that any beneficial end will be served by them now."

A great deal of criticism has been evidenced to the attitude of Major Berry to the conference because no one is able to keep him on the spot as to just why the conference is to be held, what can be accomplished.

In this connection Major Berry stated last week that "there appears to be some confusion regarding the purposes for which I have called the industry conference on Dec. 9." He said that there were two separate and distinct questions to be discussed with industry and upon which he hoped industry would take some very definite action. He stated these questions as follows:

1. Does industry in the United States want legislation (to use the President's language) "for preserving to the nation such social and economic advantages as were gained through previous emergency enactments?"

2. What further steps, in industry's judgment, need to be taken (again quoting the President) as "the best means of accelerating industrial recovery and eliminating unemployment?"

The major says that the first question calls for a decision as to whether congress should or should not attempt legislation for the continuance of NRA in some permanent form. On that question, the major concedes, "there are many opinions; but a direct decisive answer would exert a profound influence over the course of events during the next session of congress."

The second question raises the vital long-range problem of placing the industrial and economic life of the nation on a more stable basis.

Now that the cat is out of the bag and everyone knows that labor is coming to attend the conference with a definite program, there is evidence that industry has awakened and will come here with something of its own. There is every indication that a number of preliminary industrial conferences are to be held before Dec. 9 so that labor will not be able to run away with the show.

ROPER SPREADS ASSURANCE AS BERRY CAUSES JITTERS

Secretary of Commerce Roper, who has recently got himself somewhat disliked among the new dealers because of his favorable attitude toward industry, talking at a meeting of grocers last week, intimated most strongly, and apparently with authority, that all business legislation is over and that the "breathing spell" is to last.

This has aroused speculation just why, if this be so, Major Berry is being allowed to stir industry to fever pitch over his industrial-labor conference.

Speaking of the President's decla-

ration of a breathing spell, Secretary Roper said:

"It means specifically that the basic program of reform has been completed. It means that business no longer needs to feel any uncertainty as to what may come in the future with respect to governmental measures.

"Experience may make necessary some modification and adjustment of existing laws, but such changes, if made, will function to improve those relationships which are so essential to national progress."

CINCINNATI MEETING TO DECIDE PORTSMOUTH ELECTION

Announcement has been made by the national labor relations board that a hearing will be held on Nov. 18 in Cincinnati to consider a petition for an election to choose employe representatives for collective bargaining purposes in the Portsmouth, O., plant of the Wheeling Steel Corp.

Robert B. Watts, regional attorney at the board's Pittsburgh office, will act as counsel for the board, and Charlton Ogburn will serve as counsel for the Amalgamated association of Iron, Steel and Tin Workers. The workers petitioning for an election are members of five lodges of the Amalgamated affiliated with the A. F. of L.

The union claims to have a membership of 3000 of the 4800 men employed at the Portsmouth plant, and the petition invokes section 9c of the disputes act under which the board may, after investigation, either certify the representatives selected by the employes or order a secret election to determine who are the proper employe representatives for collective bargaining purposes. The lodges claim that the steel company has refused to deal with the union as the exclusive representatives of all the production departments.

EXTEND TROUGH STANDARD

The division of simplified practice of the bureau of standards has announced that simplified practice recommendation R29, eaves trough, conductor pipe, conductor elbows, and fittings, has again been reaffirmed, without change, by the standing committee of the industry.

This simplification program, which is concerned with the sizes and weights of eaves trough and conductor pipe became effective July 1, 1925, and was reaffirmed without change from 1925 to 1932.

NEW YORK CROSSINGS TO GO

Announcement has been made that the President has approved a program submitted by the department of public works, division of highways of New York, involving $12,246,000 of the funds previously apportioned by Secretary of Agriculture Wallace to New York for the elimination of hazards at grade crossings in the state. This is a part of the $200,000,000 allotted by the President for grade crossing eliminations.

Activities of Steel Users and Makers

KENNEDY VALVE MFG. CO., Elmira, N. Y., has appointed Frank De Witt & Co., Detroit, representative in the lower peninsula of Michigan, including Detroit, for the sale of iron body and bronze valves, malleable iron and bronze screwed fittings, and cast iron flanged fittings and fixtures for industrial plants and commercial and residential buildings.

♦ ♦ ♦

Luntz Iron & Steel Co., Canton, O., is moving its Cleveland office to 1372 Hanna building, under the management of B. J. Newman.

♦ ♦ ♦

Miller Steel Co., Newark, N. J., and Grammer, Dempsey & Hudson Co., Newark, N. J., recently were appointed sales agents in New Jersey for the Kidd Drawn Steel Co., Aliquippa, Pa.

♦ ♦ ♦

Carboloy Co. Inc., Detroit, manufacturer of Carboloy cemented carbide tools, dies and wheel dressers, reports an increase of 45 per cent in net sales for the first nine months of 1935 as compared to the same period in 1934.

♦ ♦ ♦

Beals, McCarthy & Rogers Inc., 50 Terrace street, Buffalo, iron and steel warehouse interest, is completing extensive alterations and improvements. Repainting of the entire structure and other improvements are included in the program.

♦ ♦ ♦

Pittsburgh Screw & Bolt Corp., Pittsburgh, will move its New York offices from 250 Park avenue to room 1467, International building, Rockefeller Center, effective Dec. 14. John A Dillon, vice president, is in charge.

Died:

WILLIAM CARLTON READ, 47, for 25 years associated in an official capacity with metallurgical research and development activities of units of Union Carbide & Carbon Corp., New York, at his home in New Rochelle, N. Y., Nov. 6. A native of Taunton, Mass., Mr. Read was graduated from Massachusetts Institute of Technology in 1909, and in 1910 became associated with the Niagara Falls plant of the Union Carbide Co. Mr. Read was a prominent metallurgist and had been intimately connected with many of the major research developments in the production of utilization of ferroalloys and alloy metals.

♦ ♦ ♦

William C. Grader, 65, superintendent of the Cleveland Wire Spring Co., Cleveland, in that city, Nov. 10.

♦ ♦ ♦

A. Winfred Bowman, 63, vice president and director of the Atlantic Screw Works Inc., in West Hartford, Conn., Oct. 30.

♦ ♦ ♦

Robert L. Poole Sr., 48, foundry superintendent of the General Railway Signal Co., in Rochester, N. Y., last week.

♦ ♦ ♦

George T. Homeier, 61, superintendent of the Lake Shore Engine Works, Marquette, Mich., for 16 years, in that city, Nov. 8.

♦ ♦ ♦

Charles A. Brose, 54, production manager at Aurora, Ill., for the Independent Pneumatic Tool Co., Chicago, in Aurora, Nov. 13.

♦ ♦ ♦

James B. Green, 57, superintendent, Lucas Machine Tool Co., Cleveland, and an employe of the company for more than 35 years, in that city, Nov. 8.

♦ ♦ ♦

John L. Johnson, 59, president of the Iver Johnson Arms & Cycle Works, at his home near Fitchburg, Mass., Nov. 9. He had been head of the organization since 1923.

♦ ♦ ♦

Howard H. Smith, 70, well-known business executive in Latrobe, Pa., in that city, Nov. 9. He was a director and treasurer of Vulcan Mold & Iron Co.

♦ ♦ ♦

Henry S. Hampson, 42, sales engineer with the Electro Metallurgical Sales Corp., New York, in New Rochelle, N. Y., Nov. 13. He had been associated with the company since 1920.

♦ ♦ ♦

James R. Geddes, 52, vice president and general manager of the Monongahela Connecting railroad, a subsidiary of Jones & Laughlin Steel Corp., Pittsburgh, in Long Beach, Calif., Nov. 8. He had been affiliated with the Monongahela road since 1902.

Correction

In an article entitled "Oxyacetylene Process Cuts Cost of Making Steel" presented in the Nov. 4 issue, page 92, the author, W. D. Wilkinson was identified with the Linde Air Products Co., New York, as engineering director. His correct title is doctor of engineering.

Industrial Men in the News

Edmund Burke, Manager of Industrial Sales, and W. Howard Pape, Manager of Sales to Oil and Gas Industry, Crane Co., Chicago

Edmund Burke

Mr. Burke (left) has done extensive educational work among engineering and industrial organizations.

He will devote his talents to developing markets for the use of valves, fittings, and specialties.

Mr. Pape (right) is well-known in the oil and gas industry, having been associated with it for 21 years.

W. Howard Pape

EDMUND BURKE, who has been appointed manager of industrial sales for Crane Co., Chicago, as reported in STEEL, Oct. 28, will direct his activities toward further developing the industrial and construction markets for the use of valves, fittings and specialties.

Prior to 1910, when Mr. Burke entered the service of Crane Co., a good part of his engineering experience was in the construction and operation of mechanical, electric and hydraulic plants. As sales engineer for Crane Co. he specialized in missionary and educational work among engineering and industrial organizations, until 1913 when he was made manager of sales of specialties. In 1921 he was given larger responsibilities and placed in charge of sales to the oil and gas industry. He held that position until his appointment.

Succeeding Mr. Burke as manager of sales to the oil and gas industry, is W. Howard Pape. He has been associated with this industry since 1914, in the capacity of designing, operating, and sales engineer. He joined the Crane organization in 1927 as special representative in the New York and, later, the Boston territories. During the past six years he has been in charge of oil sales work in the mid-continent and Gulf coast areas.

KEITH J. EVANS has been appointed manager of the sales promotion division of Inland Steel Co., Chicago, and will be in charge of the company's advertising, sales statistics, and commercial research. He has served in a similar capacity with Joseph T. Ryerson & Son Inc. since 1917, and will continue to do so in addition to his new position. He will have offices at both establishments.

Mr. Evans went with the Ryerson company in 1912, becoming advertising manager in 1917. He served continuously with that company with the exception of a brief absence during the World war. He has won a number of awards in connection with advertising activities and has held many positions in advertising associations.

♦ ♦ ♦

Robert T. Dunlap has been appointed superintendent of Vulcan Mold & Iron Co., Latrobe, Pa. He is a native of western Pennsylvania, a graduate of the University of Pennsylvania in 1917, and for a number of years following was associated with the Jones & Laughlin Steel Corp., Pittsburgh, as general foundry superintendent.

Keith J. Evans

♦ ♦ ♦

Thomas Holloway, who has been associated with the United Engineering & Foundry Co., Pittsburgh, as gear consultant, has resigned, effective immediately.

♦ ♦ ♦

Edward Pumphrey, formerly district sales manager in Detroit for Corrigan, McKinney Steel Co., is now affiliated with the Great Lakes Steel Corp., Detroit, in a sales capacity.

♦ ♦ ♦

Carlton Ohlheiser has been appointed manager of the Atlanta Ga., branch of the Fedders Mfg. Co., Buffalo, manufacturer of automobile radiators, metal beer kegs and other metal products. He formerly was on the company's engineering staff in Buffalo.

♦ ♦ ♦

G. Arthur White has been released from his contract as vice president in charge of operations with Rotary Electric Steel Co., Detroit, to accept

an important position with Richard Thomas & Co. Ltd., London, England, with which he was formerly connected. It is understood that the latter company is to begin immediately the construction of a large steel plant in England costing approximately $50,000,000, and involving complete equipment for production from ore to full-finished sheets and tin plate. Mr. White will have charge of the entire plant construction and, upon completion of the plant, will be in charge of operations. Presumably a considerable portion of the modern steel mill equipment will be purchased in this country.

Prior to his association with the Rotary company, Mr. White was identified with many companies, including Follansbee Bros. Co., American Sheet & Tin Plate Co., Trumbull Steel Co., Columbia Steel Co., and the Titanium Alloy Mfg. Co.

♦ ♦ ♦

John W. Porter, vice president in charge of sales of the Alabama By-Products Corp., Birmingham, Ala., has been elected president, succeeding the late Horace Hammond. Mr. Porter has been with the company since 1926, coming from the Alabama Co. to serve as vice president of the Hammond Iron Co., selling organization of the Alabama By-Products Corp.

♦ ♦ ♦

Lincoln Electric Co., Cleveland, announces the addition of a number of new men to its sales personnel and the opening of offices in Peoria, Ill., and Memphis, Tenn.

W. I. Miskoe, connected with the Lincoln company since 1932, has been promoted to manager of the Peoria office, under G. E. Tenney, Chicago district manager.

O. W. Farrell, previously associated with the Farrel Cheek Steel Foundry Co., and the Hoover Co., has been placed in charge of the Memphis office.

Lewis S. Hinchman, following several years shop experience in Cleveland, has been transferred to the Chicago district sales office.

Paul M. Corp, after obtaining practical welding and shop experience in Cleveland, has since Nov. 1 been located in the Milwaukee office, under the direction of George M. Johnson, district manager.

E. H. Weil has been added to the sales force in San Francisco. Prior to his affiliation with Lincoln in 1934, he was associated for several years with the Allis-Chalmers Mfg. Co.

♦ ♦ ♦

J. Homer Platten has been appointed executive assistant to the president of the American Car & Foundry Co., New York. Mr. Platten recently resigned as assistant to comptroller of Westinghouse Electric & Mfg. Co. to accept the appointment.

♦ ♦ ♦

R. H. Gardner, formerly division manager of the Washington office of A. M. Byers Co., has been transferred to Pitsburgh as manager of steel pipe sales.

Simultaneously, E. L. MacWhorter, formerly manager of the company's Philadelphia division, moves to Washington where he will head the combined activities of both divisions now known as the Washington division.

Betcone and Sickle To Push Prefabricated Steel Houses

DAVID S. BETCONE and Edward B. Sickle both of Chicago, have been elected president and vice president, respectively, of Steel Buildings Inc., Chicago, recently organized for the manufacture and distribution of self-framing, interlocking prefabricated steel homes, and commercial buildings.

David S. Betcone

Mr. Betcone has had more than twenty years' experience in designing, selling, and constructing ready-cut homes, for the last ten years being associated with Sears, Roebuck & Co. as architectural director and sales supervisor of that company's modern homes department.

Mr. Sickle is owner of the Paint Products Laboratories, of Chicago. He has had many years experience in the development of plastics and mastics for structural purposes, and became interested in prefabricated steel construction several years ago when asked to develop adhesives for fastening finishing materials to steel. Since that time he has been in charge of the development of Steelox construction. He resigned as general manager of the Steelox Co. when Steel Buildings Inc. was made the national distributor of Steelox construction.

B. T. Lourim, whose work in connection with the small American home has attracted national attention, will be associated with Mr. Betcone in designing all homes offered by Steel Buildings Inc.

Steel Buildings Inc. will sell all the materials, excluding masonry, necessary to complete modern steel homes costing $1800 to $4000 including labor and materials. It will not engage in the construction business, though some of its dealers may negotiate construction contracts.

Although standardization in the manufacturing operations is essential to the low-cost production of steel buildings, yet the buyer will have the opportunity to express his individual desires and specify them. The interlocking galvanized steel sections are being supplied by the American Rolling Mill Co., Middletown, O.

Steel Buildings Inc. has established its sales headquarters at 35 East Wacker drive, Chicago, and has also opened large warehouses in Middletown. It will distribute both by mail and through dealers. A national dealer organization is now being perfected.

Edward B. Sickle

EDITORIAL

Employers Should Prepare for Social Security Act

ALTHOUGH congress passed the social security act three months ago, it is doubtful whether employers generally appreciate fully its far-reaching implications. The larger corporations, which command the services of competent legal counsel and trained employe relations experts, are working strenuously to anticipate the complex requirements of the act. Other companies, the affairs of which do not ordinarily justify the employment of such specialists, are in danger of underestimating its importance or of failing to realize that preparations for its operation should be made at once.

Many employers have had some experience in dealing with state commissions in connection with workmen's disability insurance. They know the red tape, delay, confusion and other inconveniences which attend that relationship. Multiply those annoyances by 10, or possibly by 20, and the result probably still will fall far short of the difficulties which will be encountered under the federal social security plan.

It is reported that the doubt expressed in some quarters as to the constitutionality of the act has caused some employers to treat the matter lightly or to postpone careful study of its provisions. The element of time should discourage responsible managers from banking too heavily upon the chance that the courts will decide against the federal plan. In many cases the levy of taxes in 1936 will depend in a considerable degree upon what the employer does between now and Jan. 1 to prepare himself for the requirements of the act.

Act Is Designed To Stimulate Adoption and Operation of State Compensation Systems

The problems which deserve the immediate attention of employers are set forth in an article beginning on page 17 of this issue of STEEL. Readers will note that the security act does not provide for a federal unemployment system, but does levy a new kind of tax which is calculated to stimulate the installation of state unemployment compensation plans. Every employer of eight or more persons is required to pay an excise tax into the federal treasury amounting to 1 per cent of the total wages paid in 1936, 2 per cent of those paid in 1937 and 3 per cent for 1938 and for each year thereafter. However, the employer may obtain credit up to 90 per cent of his federal tax in the amount of his contribution paid to an approved state unemployment fund, or, he may obtain an equal credit on his federal excise tax if he maintains in a reserve account under a state company reserve system an amount equal to 7½ per cent of his total payroll for the preceding calendar year.

Obviously the law was written with the idea that employers, faced by the threat of paying a heavy excise tax on payrolls, would immediately work actively for the inauguration of state unemployment compensation programs conforming to the specifications of the federal act. These specifications are far from satisfactory in many respects. For instance, they include a clause stating that the plan shall not deny compensation to an unemployed man for refusing to accept new work if the position offered is vacant due to a labor dispute; if the wages, hours, etc., offered are less favorable than those prevailing for similar work in the locality; and if the applicant would be required to join a company union or refrain from joining a "bona fide" labor organization.

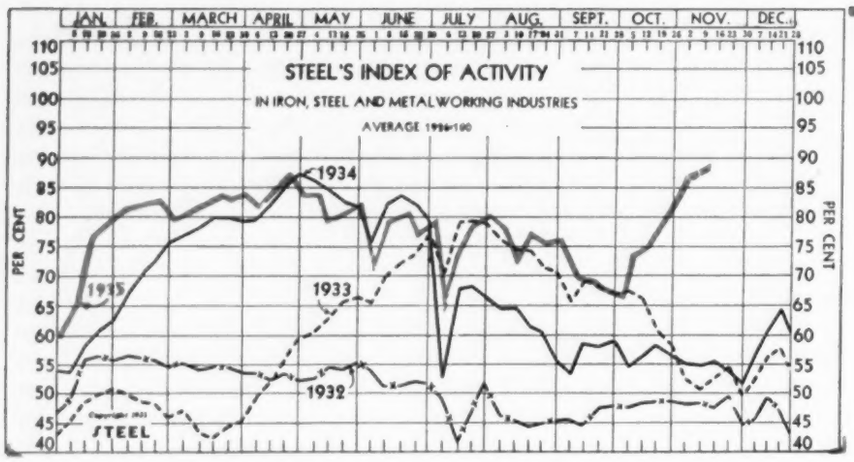
In 6 Weeks Remaining Before Jan. 1 Employers Should Shape Policies To Fit Provisions of Act

This alone shows how hurriedly the act was thrown together and how vindictively it was written as punitive legislation. Nevertheless it has become the law of the land, and as long as it remains on the statute books it must be obeyed. Moreover, inasmuch as industry itself favors the principle of sound unemployment compensation, many employers who may condemn the hasty legislation as impractical, will hope that it may serve as a stepping stone to something better or will be thrown out so that a fresh start can be made.

In the meantime, prudent employers will realize that they face a difficult problem in preparing for 1936. They will require expert advice as to changes in bookkeeping necessitated by the law. They should scrutinize payrolls to see whether or not moneys legitimately chargeable to sales or traveling expense now are entered under wages. They must determine the legal differentiation between a bona fide employe and an agency or other relationship. A thousand-and-one questions of this character will suggest themselves. All of them must be settled in the six weeks remaining before Jan. 1 if the employer is to protect himself against unwarranted taxes under the new law.

To play safe, employers will do well to get down to brass tacks on this problem at once.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking indusries increased 1.9 points to 88.3 in the week ending Nov. 9:*

Week ending	1935	1934	1933	1932
Aug. 31	77.3	55.1	70.3	45.4
Sept. 7	70.9	53.5	65.5	44.9
Sept. 14	70.1	58.7	69.1	47.8
Sept. 21	69.4	58.1	68.2	48.0
Sept. 28	68.5	59.3	66.9	47.7
Oct. 5	73.3	54.7	67.4	48.4
Oct. 12	74.9	56.4	66.0	48.7
Oct. 19	77.4	58.2	60.9	58.7
Oct. 26	82.4	56.3	58.0	48.3
Nov. 2	86.4†	55.0	52.3	48.5
Nov. 9	88.3*	54.9	50.7	47.7

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL.) *Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings, power output and auto assemblies each 20.*

Activity Index Is at Highest Point Since August, 1930

INDUSTRIAL activity continues to expand in spite of persistent irregularities in the trends of major barometers. STEEL's index for the week ending Nov. 9 stands at 88.3, a moderate gain from 86.4 in the preceding week. This represents a new high point for 1935, exceeds by a comfortable margin the peak in April of 1934, and is the highest mark touched by the index since August, 1930.

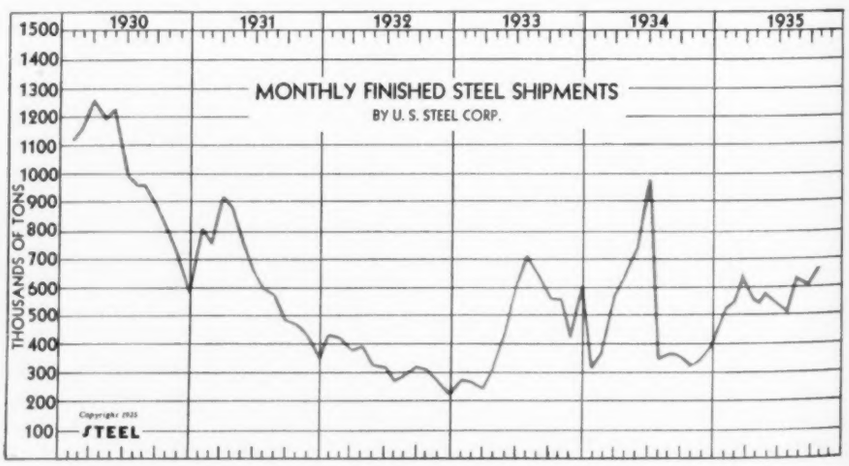
The alignment of factors contributing to the present strong situation remains unchanged from recent weeks. The most consistent gains continue to be recorded for automobile assemblies and electric power output. Steelworks operations still persist in fluctuating within a narrow range, but the trend has been unmistakably upward for about four months. Car loadings, which are sensitive to seasonal influences, have been drifting downward since the second week of October.

Electric power output still stands out as the star performer. It has broken all-time records in five of the last six weeks and in the week ending Nov. 9 it leaped through the 1,900,000,000 kilowatt-hour level to 1,913,684,000. This is almost 3 per cent above the highest pre-depression mark.

The general trend of business since mid-September has been such that a strong undercurrent of incentive for investing idle funds probably is accumulating. Some signs of this have been discernible, but the movement is not yet clearly defined. Improved earnings for the third quarter probably furnished additional encouragement. Consequently a freer flow of investment money may be expected in the next few months.

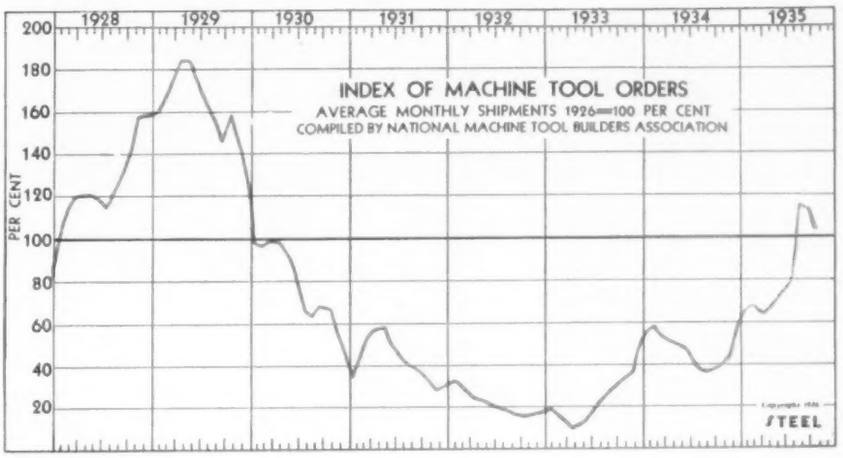
Gross Tons

	1935	1934	1933
Jan.	534,055	331,777	285,138
Feb.	583,137	385,500	275,929
March	668,056	588,209	256,793
April	591,728	643,009	335,321
May	598,915	745,063	455,302
June	578,108	985,337	603,937
July	547,794	369,938	701,322
Aug.	624,497	378,023	668,155
Sept.	614,933	370,306	575,161
Oct.	686,741	343,962	572,897
Nov.		366,119	430,358
Dec.		418,630	600,639

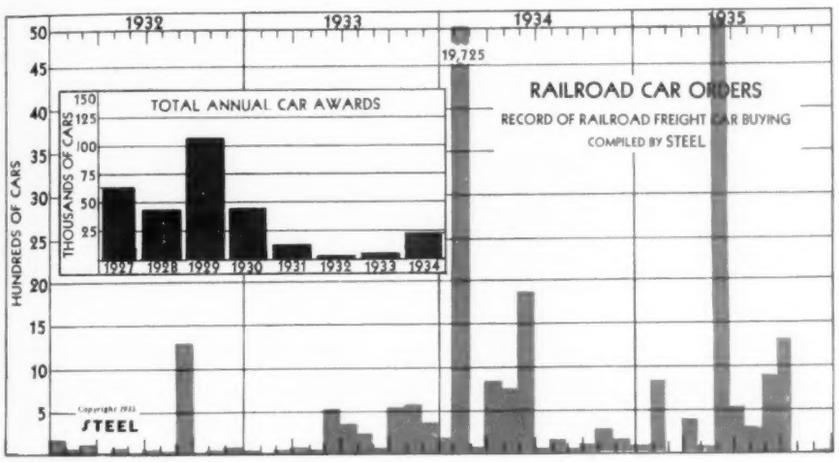


Machine Tool Orders Decline in October

	1935	1934	1933	1932
Jan.	61.3	56.5	18.3	32.8
Feb.	61.5	58.2	15.2	30.4
March	60.3	50.9	11.1	23.9
April	60.3	48.5	8.3	20.6
May	67.1	46.8	10.6	20.8
June	76.7	42.6	15.5	21.7
July	94.7	38.6	22.4	18.7
Aug.	112.2	37.1	27.9	16.8
Sept.	108.5	37.4	30.9	15.3
Oct.	102.9	40.5	33.3	15.7
Nov.	.....	44.2	38.0	16.4
Dec.	.....	54.1	51.0	17.6



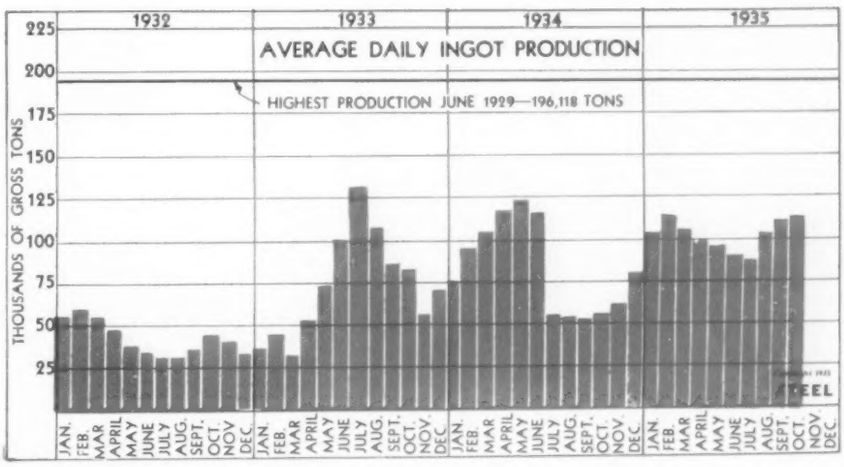
Railroad Car Orders Show Moderate Gain



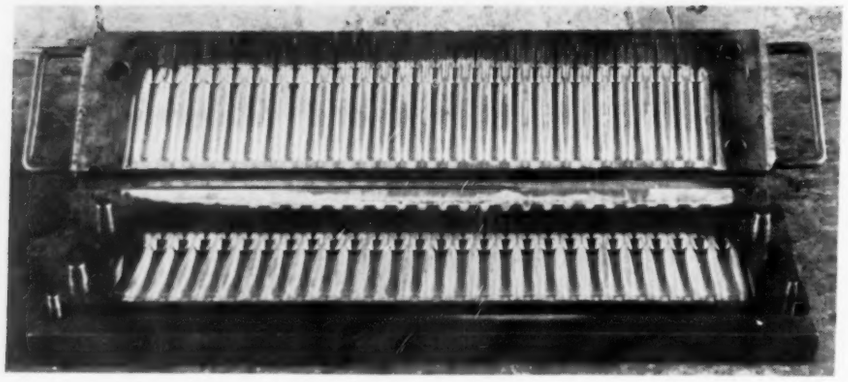
	1935	1934	1933	1932
Jan.	24	152	3	159
Feb.	806	19,725	0	35
March	0	30	5	105
April	350	800	50	0
May	2	717	8	60
June	5,151	1,835	500	0
July	500	19	306	25
Aug.	200	105	202	5
Sept.	875	7	23	1,298
Oct.	1,250	75	514	0
Nov.	.....	254	533	2
Dec.	.....	110	316	50

October Ingot Output Continues Upward

	Gross Tons		
	1935	1934	1933
Jan.	106,353	73,968	39,110
Feb.	115,740	92,164	44,709
March	110,313	103,646	33,268
April	101,558	117,443	53,817
May	97,624	125,907	73,201
June	89,236	117,672	98,632
July	87,316	59,578	126,734
Aug.	108,123	51,161	106,058
Sept.	113,193	50,759	87,811
Oct.	113,414	34,885	80,188
Nov.	.....	61,947	58,507
Dec.	.....	78,570	71,944



Selection



DIE for molding Bakelite pipestems, made of good grade of machine steel and chrome plated. Photo was taken after 12 months of continuous service

CONTINUED expansion in the use of plastic molding materials (see STEEL, Oct. 4, p. 30) exerts constant pressure on demand for die steel capable of giving still longer and more satisfactory service in the molding operation. The principal qualities desired include resistance to abrasive wear, resistance to corrosion, workability, proper surfacing and ability of the core to stand up under repeated applications of pressure without giving way. However, there necessarily has to be a blending, or a proper balance of these qualities, and at this point opinions differ as to what is the most suitable all-around steel.

Advantages and Disadvantages

Some mold makers believe that nothing can take the place of a good grade of oil hardened tool steel. Others claim they can obtain just as satisfactory results with a mild pack-hardened machine steel. Incidentally, the natural tendency among many mold makers is to want the steel that is easiest to handle. However, it is pointed out, if one makes his mold out of soft steel which is the easiest to work, he is confronted with hardening problems necessary to insure better durability in service. Of the two—oil hardened tool steel and mild machine steel—and from the standpoint of endurance at least, tool steel appears to have the advantage.

Low-carbon alloy steels and nitralloy steels offer certain advantages in diemaking, so that it would appear that steels for this purpose fall largely into four groups, and some users are inclined to list the advantages and disadvantages of these groups as follows:

Machine Steel

Advantages: (1 Easy to machine; (2) readily hobbed; and (3) low cost.

Disadvantages: (1) Must be pack hardened; (2) liable to distort under heat treatment; and (3) hard surface over comparatively soft core has tendency to crack under constant use.

Tool Steel

Advantages: (1) Minimum distortion in heat treating; (2) minimum distortion under molding pressures; and (3) long life.

Disadvantages: (1) Hard to machine; (2) not suitable for hobbing; and (3) expense.

Low-Carbon Alloy Steels

Advantages: (1) High wear resistance; (2) comparatively good hobbing qualities; and (3) longer life by reason of resistance to too rapid heat checking.

Disadvantages: (1) High initial cost: and (2) poor corrosion resistance.

Nitralloy Steels

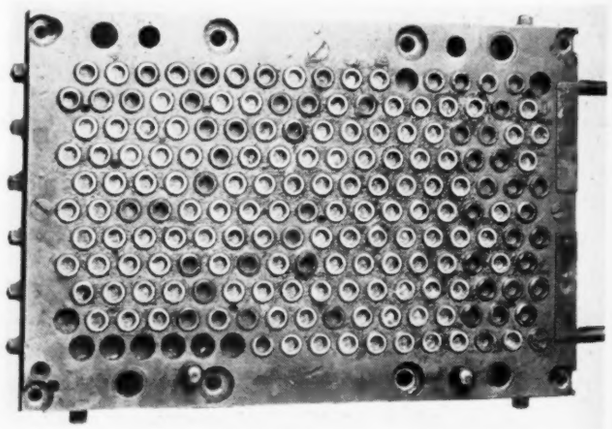
Advantages: (1) Exceptionally high wear resistance; and (2) fair machining.

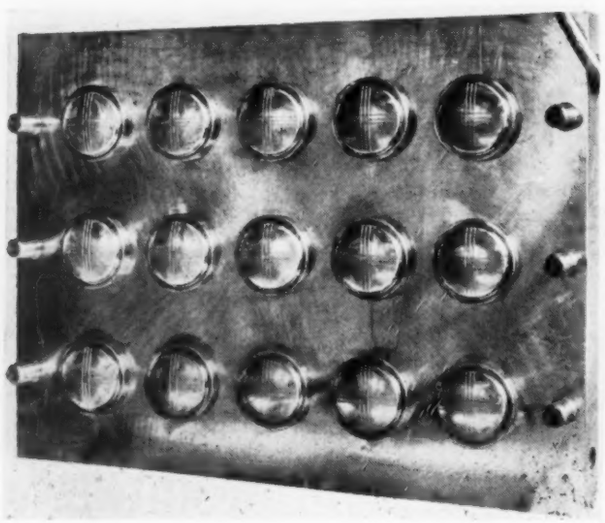
Disadvantages: (1) High cost; and (2) low corrosion resistance.

If soft steel is used, it is necessary to pack harden the mold. In addition, the mold may be chromium plated to lessen abrasive wear; also for facilitating the removal of the plastic without sticking and for increasing corrosion resistance. However, it may be added that corrosion resistance is not the factor in molding such material as Bakelite that it is in some other plastics, such as rubber for instance, for Bakelite has no chemical reaction on the mold. Such corrosion as does develop comes principally from the atmospheric elements and from dirt which accumulates when the mold it not in use.

One objection to case hardening, it is said, is that mold surface is prone to check after extended serv-

AT THE right is shown a die for molding bottle caps; it is of nickel-molybdenum steel known as Bakadie



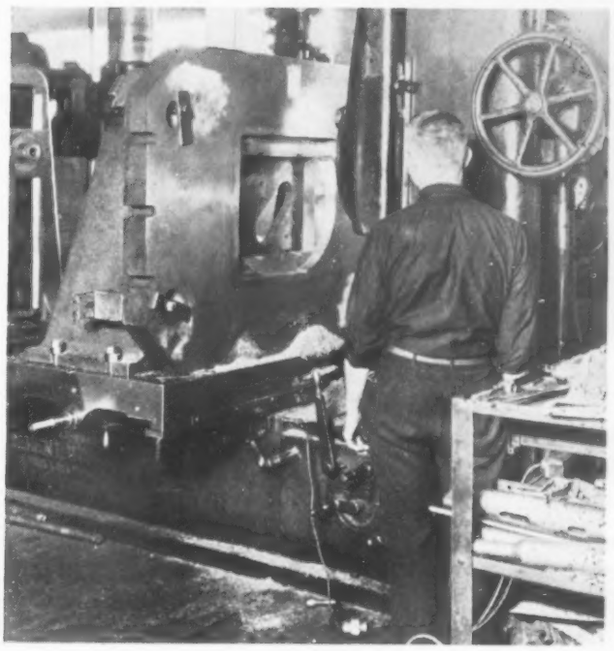


AT the left is an automobile dome light die, likewise of nickel-molybdenum steel. Photos courtesy International Nickel Co. Inc.

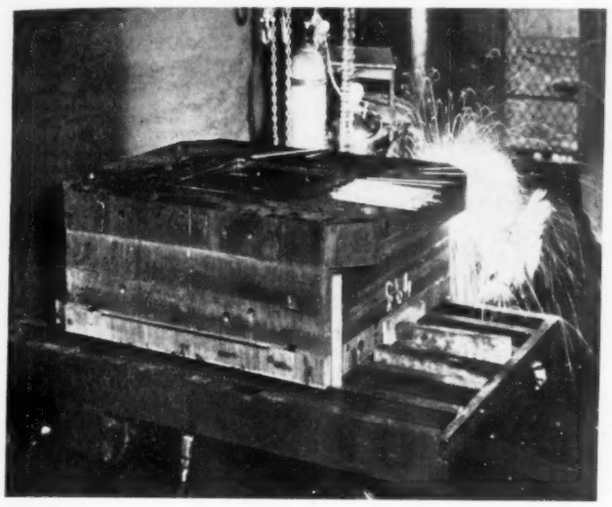
# of Die Steels for Plastic Molding

ice due to the alternate cycles of heating and cooling. A nitrided surface also is likely to check, it is stated, for the same reason. On the other hand, the oil hardened surface does not check; nor does that of low-carbon alloy steel, according to some authorities.

Relative to chromium plating, some users question whether in general it offers an advantage or not. Experience of some to date indicates that if the job is well done, the molds are better in that in storage they do not become pitted, the plastic is more



MILLING operation on the stripper plate (right) for the 7-ton die used in molding the plastic housing of the new Toledo scale



AT THE left the cavity housing rings are being welded on the lower half of the scale-case die. Photos courtesy General Electric Co.

easily removed, and a higher polish may be maintained over a period of time.

For instance, in the molding of Bakelite switchplates which have a sandblasted surface, it has been the practice to sandblast either the plates or the molds. It is, of course, more economical to sandblast the molds, except that the job must be repeated on ordinary molds every two weeks. One molder found that by chromium plating these molds they were still in satisfactory operation after a period of six months. This was taken as indicating that the polishing action of the molding material does not affect a chromium plated mold as much as it does the ordinary pack-hardened steel mold.

Views on Chromium Plating

However, some claim that the disadvantage of chromium plating molds has been that under the conditions of operation adherence of the plating becomes poor, and it flakes off in spots. The finished pieces from such molds are imperfect. Hence the plating has to be removed and mold refinished—a difficult job. But still others assert—and the preponderance of opinion appears to be on this side—that flaking is not so much a matter of operating conditions, as of improper plating.

One of the newer steels brought out for the molding of Bakelite is a nickel-molybdenum steel with low carbon content. This steel, known as Bakadie and developed by the Braeburn Alloy Steel Co., Braeburn, Pa., it is said, will take high mirror finish, and after heat treatment will show a surface hardness of 63 to 65 Rockwell. It is also said to have a tough core, and in a compression test, on a specimen 0.380-inch in diameter and 0.380-inch in length and after heat treatment, a load of 41,660 pounds was required to effect fracture.

Heat treatment involves normalizing between hobbing operations at 1150 degrees Fahr. and cooling in still air. The die should be held at heat for 1 hour per square inch of cross section. Carburizing should be carried out at 1600-1650 degrees Fahr. cooling in the pot, followed by reheating to 1475-1550 degrees and quenching in oil. Draw temperature recommended is 300 to 400 degrees, giving the above stated Rockwell hardness and case depth of 0.025 to 0.032-inch.

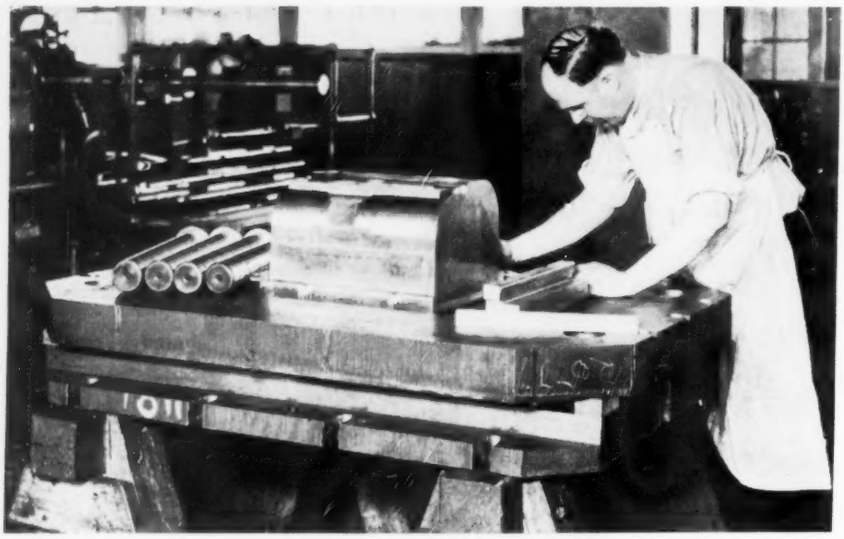
Compression tests at 42,000 pounds per square inch pressure on pieces ½-inch round by ½-inch long show resulting diameter to be 0.504-inch and length 0.496-inch.

Due to toughness of the core, the metal, of course, is less easy to hob than low-carbon steels without alloys; yet, it is pointed out, by virtue of this core hardness better wearing qualities under severe conditions and more resistance to abrasion are assured.

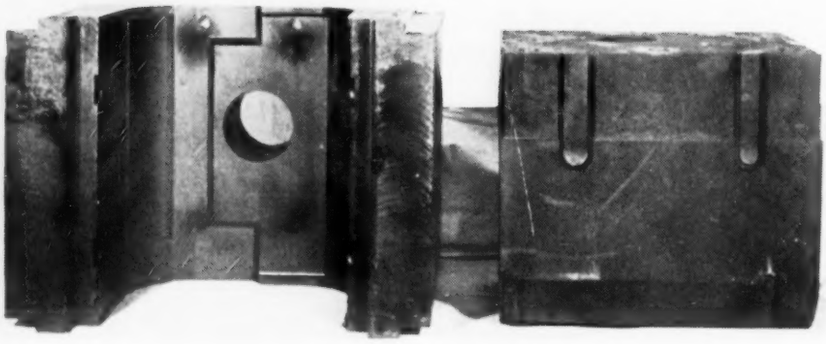
Die for Large Housing

What is claimed to be the largest die ever constructed for use in molding plastics was the one employed in production of the Plaskon housing for the new Toledo scale (STEEL, Aug. 5, Oct. 7). This housing is a molding of the urea type, weighing about 9 pounds and measuring 17¾ by 15⅜ inches by 15¾ inches deep.

The mold or die used with the 1500-ton press required for the housing weighs 7 tons. It comprises a plunger, U-shaped lower half, stripper plate, base plates and housing rings. Overall height is 42 inches and its longest dimension, that of the stripper plate, is 60 inches. Production of this housing was under the



THREE views on this page show other details of the Toledo scale - case die. Above is shown the plunger and stripper plate section assembly. At the right are the plunger and lower half of the die as they came from the heat treating operation



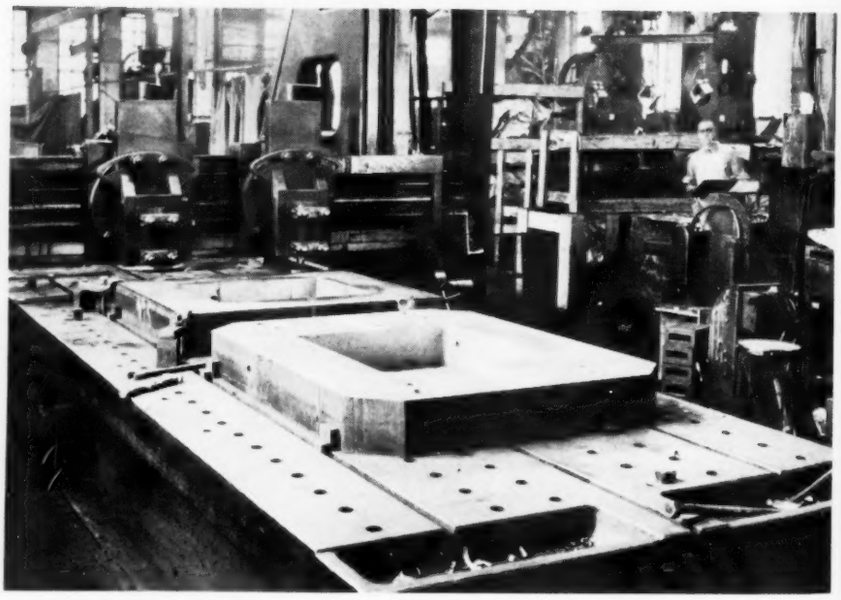
BELOW are shown two of the housing plates mounted on a planer for finishing. The lower half of the die is mounted in these plates to withstand the 1500-ton pressure required in forming the housing. Photos courtesy General Electric Co.

direction of the plastics department of General Electric Co., the press being installed in this company's Fort Wayne, Ind., plant.

Carburizing and heat treating of the die was necessary to develop the proper surface hardness for the molding operation. Special methods of handling during treatment had to be developed to avoid distortion, cracking or nicking of the parts of the mold which were machined to size.

Details of Heat Treatment

The mold parts were delivered to the Lindberg Steel Treating Co., Chicago, where they were placed into specially constructed boxes and packed with Rodmans barium for carburizing. Dead carburizing material was placed in the tray as a cushion after which the parts were placed in the trays and covered with active carburizing compound. All parts which were to be hardened were covered to a depth of 4 to 10 inches after which an additional layer of dead material was placed into the container. The dead carburizing compound tends to hold the parts rigid, thereby avoiding expansion and contracting which might take place should the parts shift. The mold and plunger as well as the end plates were equipped with large eye bolts which permitted lifting the parts from the container for quenching.



After filling the containers, they were loaded into a gas fired furnace with a temperature of 1120 degrees Fahr. The temperature was then increased to 1660 degrees Fahr. It required 10 hours to attain this temperature, after which the parts were held at heat 20 hours to obtain the proper depth of case which on this job called for 1/16 inch plus. To insure the proper depth of case, small test specimens were placed at both the top and bottom of the load.

Care Required in Cooling

After completion of the carburizing cycle, parts were furnace cooled to 1000 degrees Fahr., requiring approximately 4 hours. They were held one hour at this temperature in order to obtain uniformity and were finally slowly heated to 1500 degrees Cent. and held for 9 hours. The parts were then removed and quenched in a 10,000-gallon tank of oil (an additional 10,000 gallons was necessary before the quenching operation was finished). The parts were permitted to cool to 400 degrees Fahr. in oil, removed to air and then drawn in an electric furnace held at a temperature of 425 degrees Fahr. for 16 hours, finally being removed and air cooled to room temperature.

Due to a special arrangement of chains for removal from the furnace for quenching, it was possible to cause the U-shape of the lower half of the die to close up rather than expand, the maximum contraction at

the end of the legs being approximately 0.06-inch. No measurements were available on the plunger although it did not materially distort out of shape. It can be seen readily that it was desirable to have the parts close in rather than expand as they were practically finished machined at the time of treatment.

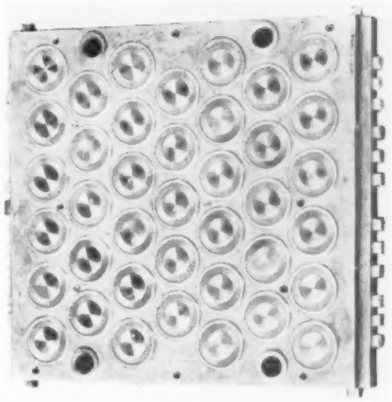
Story of Nickel Is Told In Motion Picture Film

The story of nickel is pictured interestingly in a new 2-reel silent educational motion picture film prepared recently under the supervision of the United States bureau of mines in co-operation with an industrial concern.

The story opens more than half a mile below the earth's surface, where nickel ore is mined, loaded into cars, hauled to the bottom of the shaft and crushed. Electric hoists bring the ore to the surface where it is crushed again, passed over a picking belt, pulverized in rod mills, concentrated by flotation and smelted in reverberatory furnaces and converters. Scenes which follow show spectacular operations of drawing the slag and tapping a cupola furnace, as well as electrolytic refining and casting.

Portrayed in the latter part of the film is the increased importance of nickel alloys, chiefly those with iron, steel and copper. Some scenes show the electric furnace in which the alloys are made, tapping the furnace, pouring into molds, and forging ingots. Other scenes portray handling of ingots, preheating blooms, annealing furnaces, rolling mills, a pickling plant, and other incidental manufacturing operations. The film ends with several spectacular scenes showing how nickel is utilized in industry, in sports and in the home.

Copies of this film in 16-millimeter or 35-millimeter sizes are loaned for exhibition purposes upon application to the Pittsburgh experiment station. bureau of mines, Pittsburgh. No charge except transportation expenses are made for use of the film.



POKER chip die of nickel-molybdenum steel. Photo courtesy International Nickel Co. Inc.

Seattle Proves Practicality of Open Steel Grid Decking for Bridges

BY ROBERT C. HILL
Special Correspondent of STEEL, Seattle

THE open steel grid deck for bridges has proved its practicability and utility, according to engineers in the Seattle city engineer's office, following 30 months of actual trial on the University bridge in that city. Results have proved successful beyond expectation and confirm the judgment of the local engineering staff which adopted this type of decking. Reconstruction of this span in 1932-33 was delayed an entire year because the engineers wished to be sure of their ground.

The new type of deck has demonstrated that it is ideal in every kind of weather, has resulted in elimination of automobile accidents, and keeps itself clean. Furthermore, maintenance costs are nominal. No complaints have been received, so that altogether the designers are highly pleased with the performance of this open steel grid type of deck.

Description of the decking and the reasoning which led to its adoption were detailed in the May 22, 1933, issue of STEEL. The old University bridge was paved with creosote wood block, and was so narrow that it constituted a traffic bottle neck. This was exceedingly dangerous to both automobiles and street cars. Because of a considerably down grade from the north, automobiles frequently skidded on the pavement and many serious accidents resulted. With reconstruction of the bridge. these dangers were eliminated.

The prime necessity of adopting a light-weight decking arose from the fact that two additional automobile roadways were to be added to the two bascule spans. The operating mechanism of the bridge could not carry an additional load so the wood deck, weighing 45 pounds per square foot, was replaced by the open steel grid, weighing 2 pounds per square foot. This saving in load compensated for the extra weight of the widened spans. The steel mesh is 75 per cent void and 25 per cent bearing surface.

Without doubt the greatest achievement of the new type of flooring has been the elimination of accidents. In the year prior to rebuilding, there were 182 major automobile accidents with six fatalities. Since the span was reopened, not one mishap has been reported on the structure. This is attributed in some degree to the increased roadway capacity but mostly to the almost perfect traction afforded by the steel grid deck.

Experiments and experience have proved that tires suffer no injury and are given good traction. Engineering tests show that soft material does not imbed more than ⅛-inch into the open spaces.

Snow Problem Eliminated

The open work decking automatically remains clean and dry, and these are important items in a climate where there is much rain and sometimes freezing temperatures. One week last winter, rain, snow, sleet, sleet slush, slush ice and rain on snow followed in rapid succession. In that period five other bascule bridges in the city required constant servicing. Some of these were snowed out of operation for a time. The University span was in constant operation, requiring no attention and keeping itself free of ice and snow.

Engineers have found that because of the rapid movement of automobiles over the bridge air currents sweep the underlying steel supports free of dirt accumulations. The maintenance cost of the University bridge in 30 months has not exceeded $50 and this consisted primarily of having to replace a few rivets which had worked loose.

The success of the experiment has been so marked that city engineers plan to redeck other bascule spans with the same material. "In brief," said the designing engineer, "we regard the open steel deck as the perfect flooring for this type of bridge." Many inquiries, it is stated, have come from other cities, which apparently are interested in making use of this construction.

J. A. Dunford, Seattle's assistant city engineer in charge of bridge maintenance, is credited with developing the design. The Puget Sound Bridge & Dredging Co., Seattle, had the contract for widening the spans, and the Pacific Car & Foundry Co. furnished the steel for this part of the job. The decking was of the Irving V-special steel mesh type and was furnished by the Irving Iron Works, New York.

POWER DRIVES

Speed Reducer Efficiency

Many engineers, particularly those with a partiality toward low first cost, often consider efficiency as of secondary importance especially on equipment operated only intermittently, such as on some speed reducer drives. Considering only the cost of power when generated at the plant, where sometimes it is believed not to cost anything, the engineer can in some instances apparently justify his decision. However, where power is purchased this is not so easily proved because the monthly bill includes in addition to the charge for power used a demand charge which is based on the rated horsepower of the motor.

With speed reducers of low efficiency, such as with worms of very high reduction ratios which may operate with an efficiency as low as 50 per cent or less, the motor must have a rated capacity practically double that required for another reducer with an operating efficiency of 90 per cent or more. The larger motor practically doubles the demand charge as well as the power, consumption and cost. This latter, in cases of infrequent operation, may be of minor importance, however, but in any case is about double that required for a high efficiency unit.

When the first cost of the entire installation, reducer and motor with its control and wiring, is considered the lower motor cost about balances the increased cost of the higher efficiency reducer. The advantage in decreased demand charge and power consumption will soon make up this difference, if any.

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Removing Rusted Pulleys

Where pulleys are rusted to the shaft, remove the set screws and fill the opening with a good penetrating oil and allow it to set for some time. Kerosene may be used as second choice when penetrating oil is not available. Also wrap cotton waste on the shaft at the ends of the pulley and around the key, holding it in position with a rag if necessary, and soak the waste with the oil.

In this way the oil penetrates around the key and shaft from both inside and outside. After the oil has stood for some time and penetrated into openings the pulley may be removed by a pulley puller or other standard means. In the more obstinate cases it may be necessary to permit the oil to work over night before the pulley is loosened.

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Endless Lineshaft Belts

Power transmission engineers have for years advocated the use of endless belts on lineshaft drives. Usually this has necessitated cementing the belt while on the pulleys. Either of the following methods may be used to permit the use on such drives of V-belts or flat belts made endless at the factory.

For long lineshafts, where the motor is mounted near the middle of the length of shafting, a pair of flanged shaft couplings are inserted to connect two adjacent lengths of lineshaft. These flanges are separated by a special spacer of light material thick enough so that when it is removed the belts can be slipped through the opening to place them around the shaft and over the sheave. Disks cut from worn out conveyor, rubber or canvas belting are commonly used for spacers.

On short and moderate lengths of shafting the motor is mounted near the end of the lineshaft, usually over or close to the aisle, but with the sheave or pulley on the inside of the end hanger. To install or change V-belts it is only necessary to loosen the set screws holding the bearing in the hanger. In some cases the belt then can be pushed through the hanger and worked over the end of the shaft; on other installations the hanger bearing must be slipped along the shaft.

Not tightening the set screws until the belts are on the sheaves permits springing the shaft slightly and so makes it easier to place the belts in position.

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Pulley Diameters

Several solutions are possible where two parallel line or jack shafts are belt connected but the load is too heavy for the existing drive. Obviously a heavier, wider, or special belt would solve the problem. Sometimes a special pulley covering will do the trick.

One of the most practical solutions, where space permits, is to increase the pulley diameters and so increase the belt speed. Since horsepower transmitted is a function of belt speed in feet per minute and effective tension in pounds, any change in either affects the transmission capacity of the belt. The general result of increased belt speed is a decrease in tension, assuming the same power load is transmitted, and a much better drive. A precaution, however, is that when the pulleys are changed they must maintain the same ratio to keep the same speed. Pulley coverings affect the ratio slightly unless both pulleys are of the same diameter.

When designing line shaft drives it is well to keep in mind this advantage of increased belt speed upon the transmitting capacity of the drive as often lighter or narrower belts can be used. Many plants have a surplus of lineshaft pulleys so that providing larger pulleys is not an additional expense.

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Positive Conveyor Drives

Where two or more independently driven machines or conveyors operate together, as when one feeds the other, attention is directed to synchronizing the speeds. Equipment for positive synchronization of motors is expensive, and often duplicate speed, exact to the revolutions per minute, is not necessary.

The most common difficulty with installations of this sort is that the speed loss in one drive may exceed that in the other so that work piles up on one conveyor or between the two instead of flowing smoothly. To remedy this, one Northern Ohio foundry which uses two conveyors, one feeding to the other, to handle castings between the cleaning and shipping departments, installed positive silent chain on the conveyor drives.

With this positive drive the only difference in speed of the two conveyors is that which may result from one motor being more heavily loaded than the other. This difference in motor load and speed would be of no consequence even at the extreme which would occur when one conveyor is loaded and the other empty as is the case just after starting up or before stopping.

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Many drive troubles result from buyers looking at the first cost instead of seeking the correct drive.

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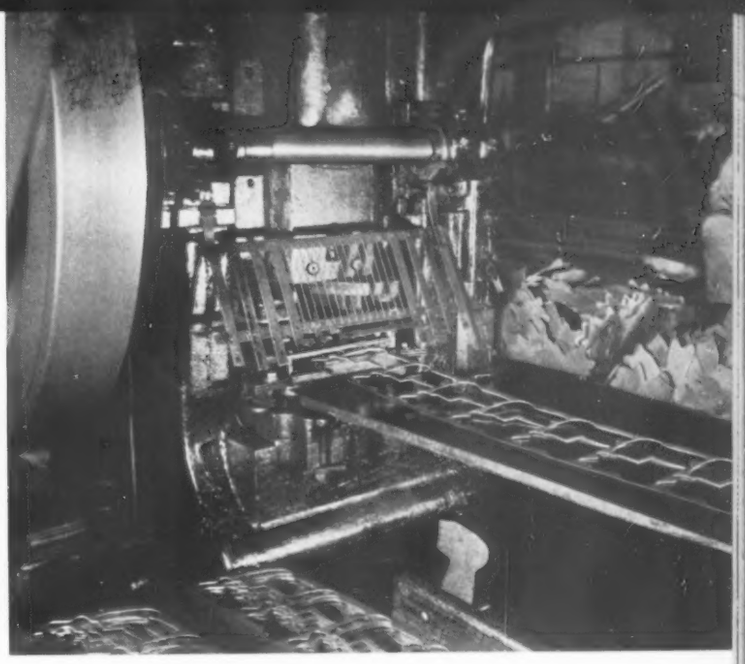
Usually it is not the useful work which a belt does but the abuse it receives that shortens its life.

STORY OF THE HOUSE THAT BUILDS JACKS



Blanking two halves of jack standard continuously from strip stock

BY W. G. GUDE
Associate Editor, STEEL

ONE of the more important of the automotive accessory industries, from the standpoint of iron and steel use, is jack manufacturing. Products of this industry include the large service jacks employed extensively by garages, as well as the commoner type which is a part of the repair equipment of each passenger car or truck.

Jack design has been influenced considerably by changes in motor car construction the past ten years, and to a limited extent by developments in the materials from which they are manufactured. Jacks in use ten years ago, when motor car wheels were large and tires small. were made to accommodate a clearance of about 10 inches below the lifting point of the automobile and had a lifting range of 6 to 7 inches. Introduction of balloon tires and smaller wheels made it necessary to provide a lower jack with a higher lift.

As the tendency to build cars still lower continued, jacks again were reduced in height and the lift increased. Use of coil spring suspension for front wheels of vehicles also emphasized the need for an extensive lift. Dimensions of a modern jack reverse those of its predecessor, some having a lift of as much as 16 inches, but being as low as 4 inches in some instances when depressed.

Use Telescoping Screws

These changes in design also necessitated a different type of operating mechanism. Old styles used a simple ratchet, but this system sometimes is inconvenient to use with the small clearance and high lift common to present automobiles. To meet this condition the screw type jack has been adopted. Screw jacks are built with one, two or three screws, depending on the lift required. The two or three screws telescope together, thereby reducing the overall height of the jack when lowered. This type, operated by a reduction gearing, commonly is used for passenger cars and light trucks. For lifting heavier loads, such as trucks and busses, the hydraulic jack is more popular.

Walker Mfg. Co., Racine, Wis., large manufacturer of automotive jacks, builds all the various types and sizes. Its jack products, other than the service lift units, may be divided roughly into four classes. These are the pressed steel screw type which is low-priced and is commonly furnished by manufacturers of light automobiles with the repair kit; the heavier duty screw jack, made to a large extent of malleable castings; the ratchet jack for both light and heavy loads; and the hydraulic jack for heaviest service, fabricated from malleable iron and rolled steel and brass.

The standard, or upright section, and base of the pressed steel jack for light cars is stamped from steel strip. Since the neck of the standard must accommodate a gear, pinion, screw and ball bearing, it is necessary to take a deep draw on this section to provide adequate clearance. Material used for this part is 16 gage, deep drawing steel. Strips are blanked for the two halves of the standard as shown in an accompanying illustration. The blanks then are formed in one stamping operation to the desired shape, ribs being pressed into the body to give added stiffness.

Assembly includes locating the screw, gear, pinion and ball bearing in one of the stampings. The other half then is set in place and the two sections are clinched to-

SECTION of jack standard being stamped from flat blank. Deep draw is required on the neck to accommodate gear and pinion

ASSEMBLING screw, gears and ball bearing in one half of standard preparatory to enclosing it with other half. The two sections are pressed together and clinched

gether firmly on a press. This provides a complete enclosure for the gears, which run in grease. No rivets are required in this assembly but they are employed to fasten the standard to the base. The latter is stamped from strip steel 0.134-inch thick. The gear and pinion are malleable iron.

This type of jack uses a double screw. The outer screw is made of hot-rolled bessemer screw stock, S. A. E. 1112, while the inner member is turned from high-carbon steel in order to provide sufficient stiffness for the relatively smaller diameter. These screws, as well as those used on other type of Walker jacks, are turned on automatic screw machines from 16-foot bar stock and cut to desired lengths. Screw diameters usually range from ¾-inch to 1 5/16 inches. In machining the inside section of the outer screw, into which a smaller screw telescopes, an inverted drill is employed. This allows chips to drop out of the hole by gravity as they are formed, rather than to be driven out by the drill. Screws used on larger jacks are heat treated and hardened.

The Walker company manufactures its own ball bearing assemblies. Races are pressed from hot-rolled, pickled and oiled strips, the stamping operation also giving them the necessary dished section. The cap affixed to the top of the screw, which is placed in contact with the axle or spring when the jack is operated, is stamped from 9-gage hot-rolled steel and is carburized to resist wear. Caps on the heavier jacks are drop forged.

Where Malleable Is Used

An important feature in the design of this and other types of jacks is the locating of the crank handle socket above the center of gravity and in the center of the unit, so that it will be upright when under the vehicle.

Jacks having a capacity of more than 1 ton generally are made with a malleable iron base and standard. This type of construction applies to both the screw and hydraulic jacks. Oil reservoir of hydraulic jacks is of welded tubing, while the pressure cylinder is unannealed seamless tubing. The hydraulic mechanism is enclosed in a heavy malleable iron base. Grinding and polishing give a smooth inside surface to the hydraulic cylinder, and to prevent seizure of the piston, cadmium plating is employed. This coating gives a somewhat oily surface and overcomes an occasional tendency for the two cylinders to freeze because of the close fit. All hydraulic jacks are tested for their rated capacity and are required to carry this load for a sustained period to detect possible leakage.

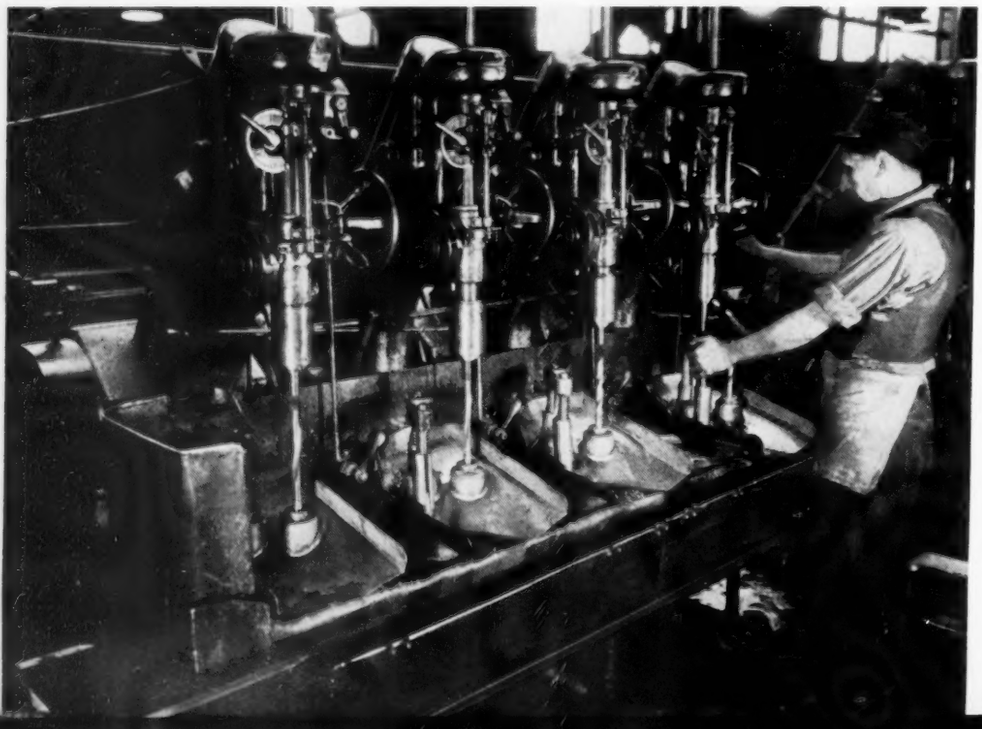
Ratchet jacks still are manufactured for old model passenger cars and trucks. These are made with pressed steel bases and standards for lighter capacities and of malleable iron in the larger sizes. One type of ratchet jack, adaptable to low clearance, uses a patented mechanism which includes a rack bar which folds around in the base, straightening out as the lift is made.

Service jacks are intended for rapid lifting and have larger capacities than the small, emergency jack. They usually involve a truck, mounted on wheels to enable it to be rolled underneath the vehicle, a lifting mechanism and long lever arm. The larger portion of the unit is of malleable castings. Certain parts subjected to wear, such as the lifting cap, are drop forged steel, while a small amount of rolled steel also is used.

Presents Treatise on Cast Iron Alloy Roll Failure

Details of fractures of chromium-molybdenum rolls are presented by J. Selwyn Caswell, lecturer in engineering, University college, Swansea, in a paper entitled "Notes on Roll Failures with Reference to Chilled Iron Cast Rolls Containing Chromium and Molybdenum" and published by the Institution of Mechanical Engineer, Storey's Gate, St. James' Park, London, S.W.1.

Foundry experiments with this type of alloy rolls are described and illustrated. The probable causes of fracture are discussed in the light of quality and structure of the iron, the design of the rolls and the effect of thermal stress.



Drilling inside of screw for multiple screw jack. Operation is performed by inverted drill, allowing chips to drop out of hole by gravity

BRAZING the New ALL METAL RADIO TUBES

RADIO tubes—made of steel—smaller, stronger, more efficient and dependable—are brazed in continuous conveyor furnaces of the type shown above—furnaces specially designed and built for this purpose by The Electric Furnace Co., Salem, Ohio.

Electric Furnace Co.'s controlled atmosphere furnaces play an important role in the manufacture of the new RCA All-Metal Tubes. Several furnaces of the above type are in operation bright annealing as well as brazing parts for the production of thousands of these tubes per day.

Investigate the continuous furnace method for joining *your* products. It is the most important process yet developed for joining metal parts. Intricate assemblies are loaded on a conveyor, carried through this equipment and discharged completely joined—neater, stronger and more economically than by any other method.

Investigate the brazing process for your products —many products are being made neater, stronger and more economically by this process.

We have designed and built equipment for making neat, breakproof joints for processes ranging from the delicate operation of joining watch parts to the brazing of heavy duty automotive parts—for making strong, leak-proof, air-tight joints in products ranging from radio tubes to large evaporator and refrigerator units.

Our engineers will be glad to discuss our developments in controlled atmosphere brazing, bright annealing or scale-free heat treating equipment, or work with you on any of your other furnace or heat treating problems.

THE ELECTRIC FURNACE CO.

SALEM, OHIO.

Fuel Fired Furnaces

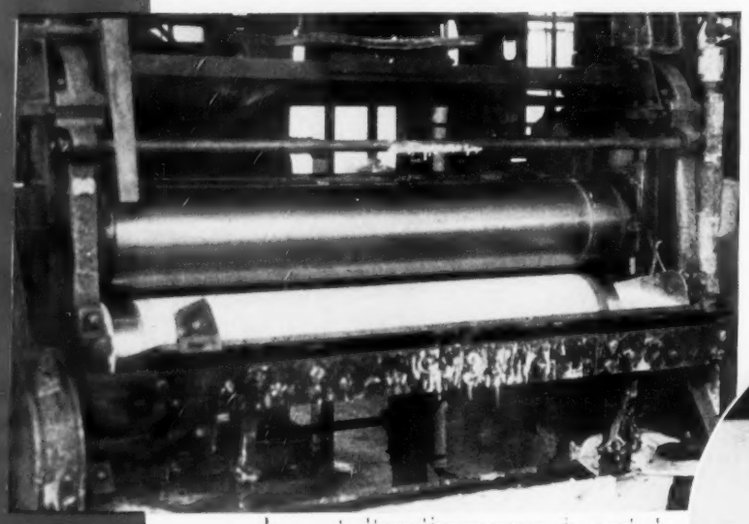
Electric Furnaces

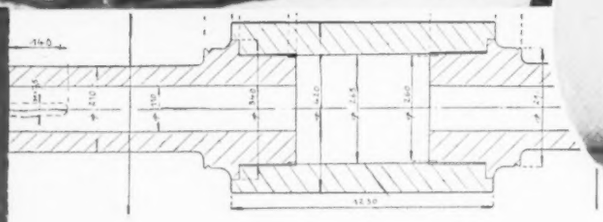
NITRALLOY

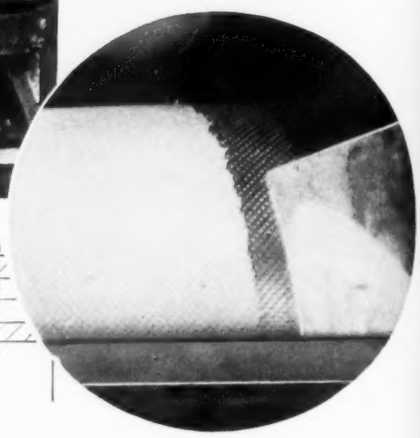
THE HARDEST KNOWN STEEL SURFACE

for

WEAR RESISTANCE







TYPICAL APPLICATIONS OF NITRALLOY

Calender Rolls
Cams and Camshafts
Chain Links and Pins
Connecting Rods
Crankshafts
Cylinder Liners
Die Casting Dies and Cores
Fan Blades
Fuel Injector Parts
Gears
King Pins
Pinions
Piston Rods and Rings
Pump Rotors and Sleeves
Push Rods
Scale Balances
Scale Blocks
Seaming Rolls
Seats for Valves
Shackle Bolts
Shafts
Sockets
Spindles
Splines
Sprockets
Steering Worms
Tappets
Valve Gauges
Valve Seat Rings
Valve Stems and Sleeves
Water Pump Shafts
Worms
Wrenches
Wrist Pins

NITRIDED STEEL CALENDER ROLLS

The upper illustration and insert show a corrugated steel calender roll of Nitralloy in use in a large rubber plant . . . the final answer, after exhaustive experiment, to overcome the wear of constant production. The drawing illustrates a cross section of a typical nitrided steel calender roll frequently used in the textile, paper, and rubber industries.

COMPANIES LICENSED BY THE NITRALLOY CORPORATION

MANUFACTURERS OF NITRALLOY STEEL

Bethlehem Steel Co., Bethlehem, Pa.
Crucible Steel Co. of America, New York, N. Y.
Firth-Sterling Steel Co., McKeesport, Pa.
Ludlum Steel Co., Watervliet, N. Y.
Vanadium-Alloys Steel Co., Pittsburgh, Pa.
The Republic Steel Corp., Youngstown, O.

MANUFACTURERS OF NITRALLOY STEEL CASTINGS

Lebanon Steel Foundry, Lebanon, Pa.
Empire Steel Castings Co., Reading, Pa.
The Massillon Steel Castings Co., Massillon, O.
Milwaukee Steel Foundry Co., Milwaukee, Wis.
Warman Steel Castings Co., Los Angeles, Cal.

OPERATING AND ACCREDITED NITRIDING AGENTS

Arrowhead Steel Products Co., Minneapolis, Minn.
The W. S. Bidle Co., Cleveland, O.
Camden Forge Co., Camden, N. J.
Commercial Steel Treating Co., Detroit, Mich.
The Lakeside Steel Improvement Co., Cleveland, O.
Lindberg Steel Treating Co., Chicago, Ill.
New England Metallurgical Corporation, South Boston, Mass.
The Queen City Steel Treating Co., Cincinnati, O.
Wesley Steel Treating Co., Milwaukee, Wis.

MANUFACTURERS OF FURNACES SUITABLE FOR NITRIDING

The Electric Furnace Co., Salem, Ohio.
Leeds & Northrup, Philadelphia, Pa.

And Now . . . NITRALLOY Cylinder Barrels for the Latest Series of 750 H. P. WRIGHT CYCLONE ENGINES

Finished nitrided Nitralloy cylinder barrel before being fitted into aluminum cylinder head.

Photographs courtesy of the Wright Aeronautical Corporation, Paterson, N. J., and Canton Drop Forging Manufacturing Company, Canton, Ohio

Nitrided Nitralloy cylinder barrel showing forging at left, cylinder barrel after being nitrided for fifty hours and the finished cylinder barrel after machining . At the right, a cylinder barrel showing the stages from 5½" round bar to finished forging.

DEPENDABILITY and advanced engineering design have long been characteristics of airplane engines built by the Wright Aeronautical Corporation.

And now, where high power and high rotated speed present new problems in the design of heavy duty airplane engines, after considerable research and development on the part of Wright Engineers and the Crucible Steel Company of America, it was found that nitrided cylinder barrels considerably increase the life of the engine.

As a result, the latest series of 750 h.p. Wright Cyclone Engines are built with Nitralloy cylinder barrels. After heat treating, quenching and normalizing the forging, the Nitralloy cylinder barrel is nitrided for approximately fifty hours to obtain a case of .020 to .030 of an inch and shows a Vickers Brinell test of approximately 800.

Nitralloy, when nitrided from 50 to 70 hours, produces the hardest known steel surface, normally from 1000-1100 Vickers Brinell. However, in the nitrided Nitralloy cylinder barrel shown above, the hardness is modified slightly to obtain greater toughness in the nitrided case.

The nitriding process and Nitralloy are protected under patents controlled by

THE NITRALLOY CORPORATION

230 PARK AVE., NEW YORK, N. Y.

Acetylene Industry Reviews Progress

(*Concluded from Page* 16)

allied industries, to be held in London next June, said A. Bede Harrower, British Oxygen Co. Ltd., London. Greetings were conveyed by Mr. Harrower from prominent members of the International Acetylene association abroad. They included A. Gabdillon, president of the association's permanent international committee with headquarters at Geneva, J. Donald Pollock, chairman of the British Oxygen Co. Ltd., and president-elect of the twelfth international acetylene congress, Sir Robert Hadfield, Sheffield, England, Sir Harry McGowan, chairman of Imperial Chemical Industries Ltd., London, and Sir Phillip Cunliffe Lister, British secretary of state for air.

"Handling, Storage and Proper Control of Compressed Gas Cylinders" was the title of a paper by F. R. Fetherston, secretary, Compressed Gas Manufacturers' association, New York. It set forth a procedure which can be followed with advantage both to owners of such cylinders and consumers of the gases shipped and stored in them.

Precautions To Prevent Fires

Prevention of welding and cutting fires was discussed in a paper submitted by C. D. Abbott, Cleveland district manager, Associated Factory Mutual Fire Insurance Companies, Boston. The author cited numerous instances where fires resulted from operations with the oxyacetylene process. He cited the precautions which usually prevent such fires. He recommended that the use of portable cutting and welding outfits without permission of the plant engineer, fire chief or other responsible individuals be prohibited, and he suggested a printed form for use in such cases.

Abundant life in the future, as in the past, will come from voluntary cooperation of individuals, according to the two principal speakers at the opening session, Merle Thorpe, editor, *Nation's Business*, Washington, and Dr. W. E. Wickenden, president, Case School of Applied Science, Cleveland.

To look to politicians and to government for business recovery is unsound, said Mr. Thorpe, who strongly advocated against any tendency on the part of business men to postpone making decisions pending political developments. He deplored the recent tendency to blame the depression on bankers, manufacturers, machines and other factors which made of the United States the wealthiest nation in the world, with the highest standard of living. As an instance of the status of wealth in this country, despite popular impression, said Mr. Thorpe, 60 per cent of the farms and 55 per cent of the homes in this country are owned without mortgages or encumbrances of any kind.

Dr. Wickenden also stressed the fact that the process of recovery is one brought about by cooperative individual action. A large part of his address was devoted to the better living conditions which result from the work of scientists.

Presentation of the Morehead medal for 1934 was made to Worthy C. Burknam (see STEEL of Nov. 4, Page 84), in recognition of his achievements in designing oxyacetylene cutting and welding machines. The award was made by H. B. Pearson, Compressed Industrial Gases Inc., Chicago, past president of the association.

Session on Metallurgy of Welding and Cutting Breaks Attendance Records

METALLURGY of welding and cutting was a subject which attracted 300 members and guests of the International Acetylene association to the meeting on the afternoon of Nov. 13. This session, incidentally, was the best attended of any session ever held by the association. C. A. McCune, secretary, Magnaflux Corp., New York, and a past president of the association, presided as general chairman. A. E. Gibson, vice president, Wellman Engineering Co., Cleveland, officiated as chairman during the technical portions of the session.

Before introducing the first speaker, Mr. Gibson appropriately pointed to the increased use of welding and cutting in the heavy industries during the last few years, at the same time making it clear that in spite of this progress there is need for more knowledge concerning the metallurgy of the processes. He said this was true in particular with the low-alloy, high-tensile steels and other special steels which recently have come into prominence in connection with the construction of transportation equipment and heavy machinery.

A paper on welding and cutting high chromium steels, presented by W. J. Priestley, vice president, Electro Metallurgical Co., New York, provided information along the line referred to by Mr. Gibson. The speaker stated that steels containing chromium ranging from 0.5 to 30 per cent are being used for service calling for light-weight construction and for resistance to wear, corrosion and oxidation at high temperatures. The early welding of these steels brought difficulties which have now been over-come by the combined efforts of chemists, metallurgists and engineers.

Chromium, at high temperatures has a marked affinity for both oxygen and carbon, which makes flame control in welding exceedingly important. The most satisfactory flame adjustment is a neutral one with no excess of either oxygen or acetylene, said Mr. Priestley. The use of a flux with a high solvent power for cromium oxide is essential.

The speaker presented a broad classification of the high-chromium and stainless steels as follows: Steels containing 4 to 7 per cent chromium, with or without additional elements, as molybdenum or tungsten; steels containing 12 to 30 per cent chromium; and steels containing 18 to 30 per cent chromium and 8 to 12 per cent nickel. He discussed the welding of each group in detail and the effect of columbian or titanium additions to prevent air hardening. In conclusion, Mr. Priestley discussed the procedure for cutting high-chromium steels.

Discussing Mr. Priestley's paper, E. E. Thum, editor, *Metal Progress*, Cleveland, stated that alloy steels containing up to 14 per cent chromium have the general characteristics of steels, while the alloys containing above 14 per cent have different characteristics. The 18-8 chrome-nickel austentic steels are not stable under certain high-temperature conditions, therefore columbium and titanium are added to make them stable. The trend, said Mr. Thum, is to develop special alloys for special purposes.

Flame Cutting of Plates

Further studies of oxyacetylene cut steel plate were reported in a paper by Prof. J. H. Zimmerman, Massachusetts Institute of Technology, Cambridge, Mass. In a paper presented a year ago, the speaker had reported on the effects of flame cutting ½-inch steel plates, as compared with shearing, sawing and machining, and his conclusions were that flame cutting was just as good as the other methods and in some cases superior.

This research aroused the question as to whether these conclusions would apply to thicker plates and other types of structural steels. Therefore, during the past year, Prof. Zimmerman ran flame cutting tests on four

other types of steel in ½, 1 and 2-inch thicknesses. He studied macrographs and micrographs, hardness tests and 180-degree bend tests, and arrived at conclusions which indicated that his earlier results in general applied to all steels and to all thicknesses.

H. L. Whittemore, chief, engineering mechanics section, national bureau of standards, Washington, in contributing a discussion, used Prof. Zimmerman's research as an example to point out the desirability for industry to co-operate with testing laboratories, particularly university laboratories, in investigating current industrial problems. One difficulty, he pointed out, is that industry wants results to turn out in a predetermined way and is provoked when results are contrary.

Cites Favorable Research

Chairman Gibson then spoke at some length on the point made by Mr. Whittemore. During the past year, he has been co-operating with a Cleveland school in pursuing several investigations on the metallurgy of welding and has been highly gratified with the results. It is just as important, he said, for industry to know that certain practices are not feasible as to know that other practices are feasible.

Hydrocarbon fuel gases, including city gas, natural gas and propane for cutting were discussed in a paper by Dr. George V. Slottman, combustion engineer, Air Reduction Sales Co., New York. In the investigation, the preheating characteristics of the saturated hydrocarbons were studied in comparison with the unsaturated hydrocarbon, acetylene. In a variety of commercial apparatus, the optimum oxygen gas-mixing ratios, the speeds of preheating steel plate, the relative volumes of fuel gas and preheating oxygen and the volumes of cutting oxygen required, with the saturated hydrocarbons, were compared with acetylene practice.

According to Dr. Slottman, it was found that the optimum oxygen gas mixing ratios for the highest flame temperatures were: For city gas, 0.75 to 1; for natural gas, 2 to 1; for propane, 4.5 to 1; and for acetylene, 1.7 to 1. In actual works practice, these ratios are rarely achieved, due to the difficulty of adjusting the flame character by eye. In the case of acetylene, the mixing ratio may well vary from 1.1 to 1.5 to 1, and in the case of propane for example, from 3 to 6 to 1. The saturated hydrocarbon flames are particularly difficult to adjust, since their flame inner cone is not nearly as sharply defined as that of acetylene.

It was further noted, stated the speaker, that the several gases cannot be compared on a heating value basis, because of differences in flame

temperature and in heating efficiency; that the preheating oxygen requirements with the saturated hydrocarbons are higher than with acetylene, and that the cutting oxygen volumes to produce comparable cut quality are similar, with the saturated hydrocarbons, to those necessary with acetylene.

From the data presented, declared Dr. Slottman, it is evident that the economy in the use of the saturated hydrocarbons as preheating fuels for steel cutting in place of acetylene, depends on the price of oxygen and that under the prevailing price structure such use is uneconomical.

This sessions was concluded with a paper on gas welding aluminum and its alloys, presented by G. O. Hoglund, supervisor of welding, Aluminum Co. of America, New Kensington, Pa. The author discussed the welding characteristics of aluminum and its various alloys, including those which are not heat treated and those which are heat treated. He also dealt with the effects of welding on the parent metal and the strengths of welds.

Mr. Hoglund concluded his paper with numerous illustrations of equipment which had been fabricated by gas welding. These examples included apparatus for the dairy industry, the brewing industry, distilleries, the chemical industries and the transportation industry.

1400 Witness Demonstrations of the Oxyacetylene Process at I.A.A. Forum

AN OUTSTANDING feature of the International Acetylene association's convention program was the welding and cutting forum conducted on the evening of Nov. 13. Held in the auditorium of the Brotherhood of Locomotive Engineers, this forum attracted an audience of 1400 to witness the demonstrations of welding and cutting and the testing of welded products.

Opening the forum with a few introductory remarks, Philip Kearny, K. G. Welding & Cutting Co., New York, and president of the association, turned the program over to William B. Browning, service engineer, Linde Air Products Co., Chicago. Mr. Browning described the manufacture of acetylene, its properties, and its uses in industry for welding and cutting. He also explained the use of liquid air in making shrink fits.

As a second part of the program, John J. Crowe, engineer in charge of apparatus research and development, Air Reduction Co., Jersey City, N. J., and president of the American Welding society, explained hand cutting, machine cutting and use of the oxygen lance. After he had described the various types of equipment, demonstrations were made.

A. B. Kinzel, chief metallurgist, Union Carbide & Carbon Research Laboratories Inc., New York, and chairman of the iron and steel division of the American Institute of Mining and Metallurgical Engineers, conducted the third part of the forum. The speaker described and demonstrated how metals are identified by fracture test and spark test before the proper procedure for welding is selected. He then discussed the metallurgical effects of welding and directed demonstrations of certain recent welding techniques. These include welding of cast iron, using cast iron and bronze welding rods, and welding pipe by the backhand and forehand methods.

Stresses Need for Safety

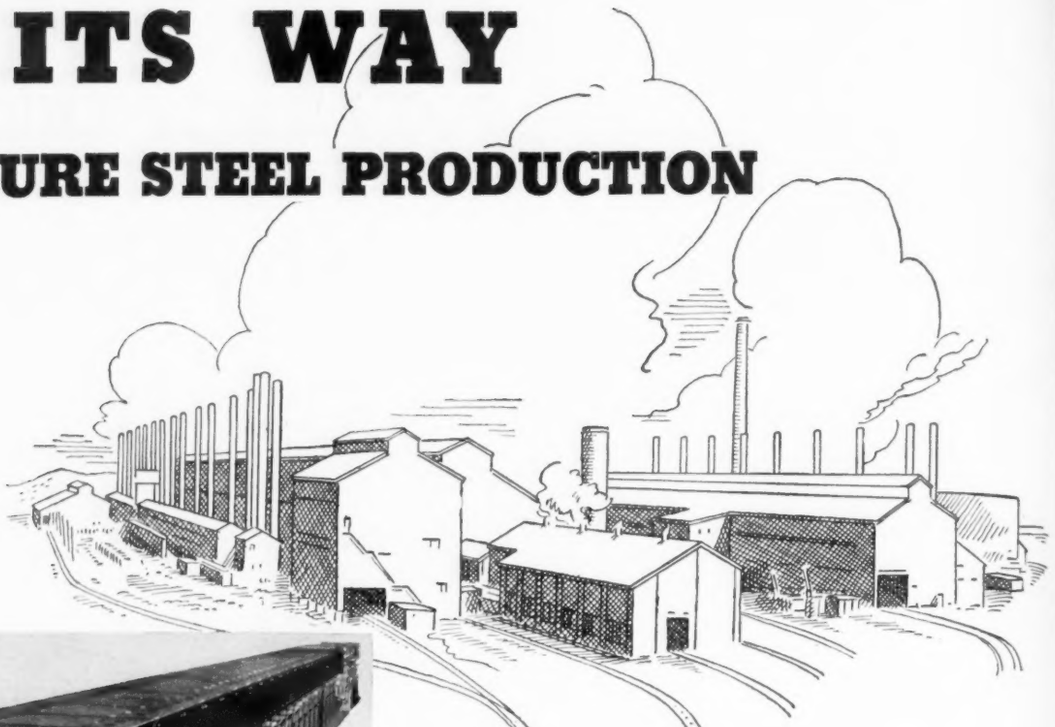
While the stage was being cleared of welding equipment and being reset for the final part of the program, James I. Banash, past president, National Safety council, and consulting engineer, International Acetylene association, Chicago, made a plea for safety in the handling and use of acetylene. Every precaution has been taken in the design of equipment and in the writing of codes to provide safety for workmen, but, he said, workmen occasionally insist upon being careless. The association, he pointed out, is always ready to co-operate with industry in promoting safety.

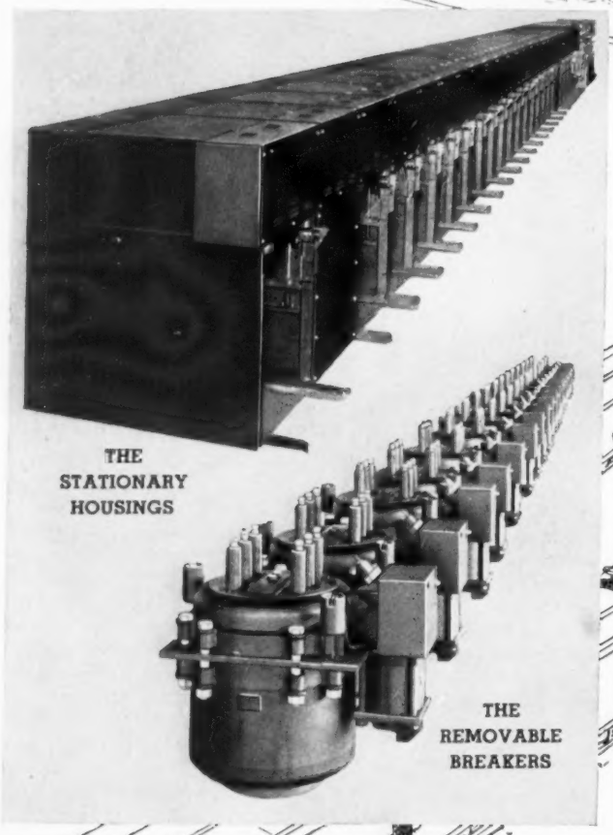
As the concluding part of the forum program, Mr. Crowe and Mr. Kinzel collaborated in describing destructive and nondestructive tests of welds and welded products. Demonstrations were made of fracture tests, bend tests, hardness tests, tensile tests, compression tests and hydrostatic tests.

Demonstrations performed throughout the forum were supervised by Owen C. Jones, editor of *Oxy-Acetylene Tips*, New York.

ON ITS WAY

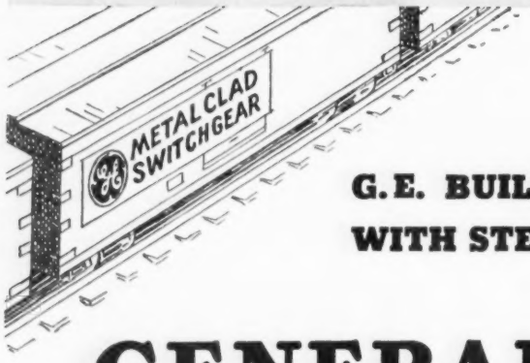
TO INSURE STEEL PRODUCTION





THE STATIONARY HOUSINGS

THE REMOVABLE BREAKERS



G.E. BUILDS WITH STEEL

LITERALLY, trainloads of G-E metal-clad switchgear have gone to steel mills in recent months. Units built with FKR-255 oil-blast breakers are practically the industry's standard for heavy-duty, high-voltage mill switching. ● Besides improving operation to protect production, G-E metal-clad gear will reduce your electrical investment, and, being shipped assembled, it simplifies the problems of planning and design. It also provides the safest of all switching arrangements. Discuss in detail with your G-E representative the many reasons why this type of switchgear is so popular. General Electric Company, Schenectady, N. Y.

860-11

GENERAL ELECTRIC

METHODS AND MATERIALS

Handy Turntable Simplifies Welding

IN REPAIRING or rebuilding certain articles by welding, the work is greatly simplified if the operator can set up the job so that he will not have to walk around the work bench to get at the object from various sides. Accordingly, any means of conveniently changing the position of the work proves to be a time saver and an aid to better workmanship. It enables the operator to stand or sit in one place during the entire welding operation. The ideal device for making such convenience possible is some sort of an easily operated turntable upon which the object can be placed.

An interesting turntable welding jig, assembled in a western machine shop from scrap automobile parts, was described in the November issue of *Oxy-Acetylene Tips*. The movable top or platform consists of a flywheel attached by means of a flange to a roller bearing about 4 inches in diameter. This assembly is the turntable top.

The lower part of the jig consists of another flywheel inverted so that it fits over a used calcium carbide drum. The slightly tapered bearing on the upper half then fits into the inner circumference of the lower wheel. Thus it turns easily and offers at the same time a solid working surface. The operator of this unique welding jig has merely to push his welding rod against one of the gear teeth on the outer rim to cause the movable top to rotate easily and smoothly.

This little jig, which revolves so easily to the touch of the welding rod as the work progresses, can be assembled easily in the average welding shop. It should appeal strongly to the practical welding operator who has much welding to do on small objects and appreciates the value of making his work easier. There are possibilities for unusual usefulness in production work that requires the work to be rotated while welded. In modifying the design to meet special needs, it is well to keep in mind the fact that the roller bearing should be of sufficient size so that the turntable top will be perfectly steady during the welding operation.

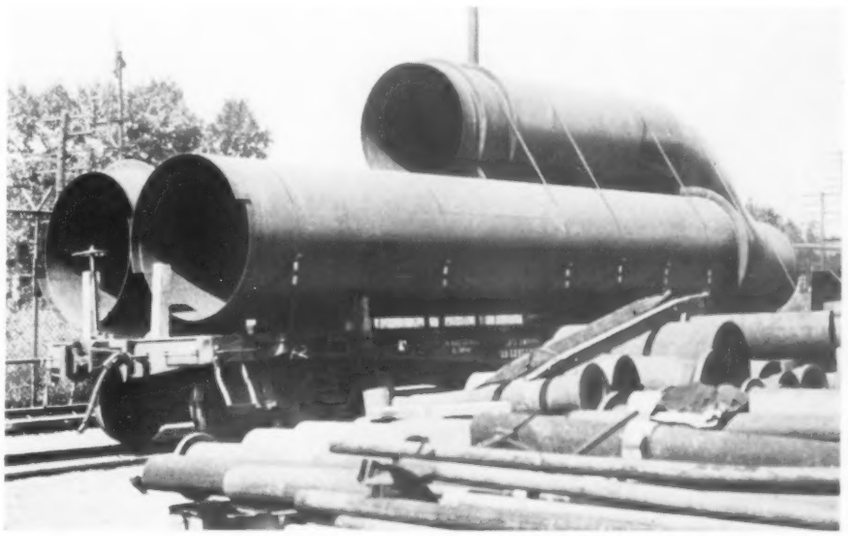
S S S

Electronic Control Finds Varied Uses in Industry

Although the electronic control, which includes the photoelectric cell or electric eye and other types of tubes, is of comparatively recent origin, it has found a wide range of industrial applications. A number of these are in the iron and steel and metalworking fields, among them being the following:

Reversal of rolls in steel mills, removal of soaking pit covers, control of cut-off saws, furnace temperature control, controlling thickness of sinter beds, smoke indicators in smoke stacks, detecting fine cracks in polished surfaces, automatic opening of doors for trucks, safety protection of machines, detection of flaws, turning threads on pipe, piling material on conveyors, pressure application on testing welds, pre-selective conveyor dispatching systems, automatic weighing, flagging tote pans on con-

Large Steel Gas Main is Welded



LARGE GAS MAIN FOR AUTOMOBILE MANUFACTURER: Here is shown a carload of 5-foot diameter welded steel pipe leaving the Chicago plant of the Chicago Bridge & Iron Works, this pipe being a portion of an 800-foot gas main fabricated for the Ford Motor Co. for installation in Dearborn, Mich. The pipe was made from ⅜-inch steel plates and was butt welded

veyors at selected stations, controlling thickness of enamel on wires, rejection of nonsharp razor blades, calipering steel balls automatically, and controlling automatic sheet catchers in steel mills.

S S S

Stainless Steel Finds New Uses in Arch Supporters

From a hospital in New York comes news of a use of stainless steel that promises relief to thousands of people who suffer from weak or fallen arches. Arch supporters have been made with the important sections constructed of 18-8 chrome-nickel stainless steel.

According to the *Electromet Review*, published by the Electro Metallurgical Co., New York, the development of these supports, like that of many other hygienic devices, is the natural outcome of the years of medical experience with stainless steel. The realization that this metal is immune to rusting or staining from perspiration acids and is at the same time immensely strong, has directed much attention toward its use in these supports and in other apparatus such as body braces. The excellent workability of this steel makes the construction of these articles a relatively simple operation.

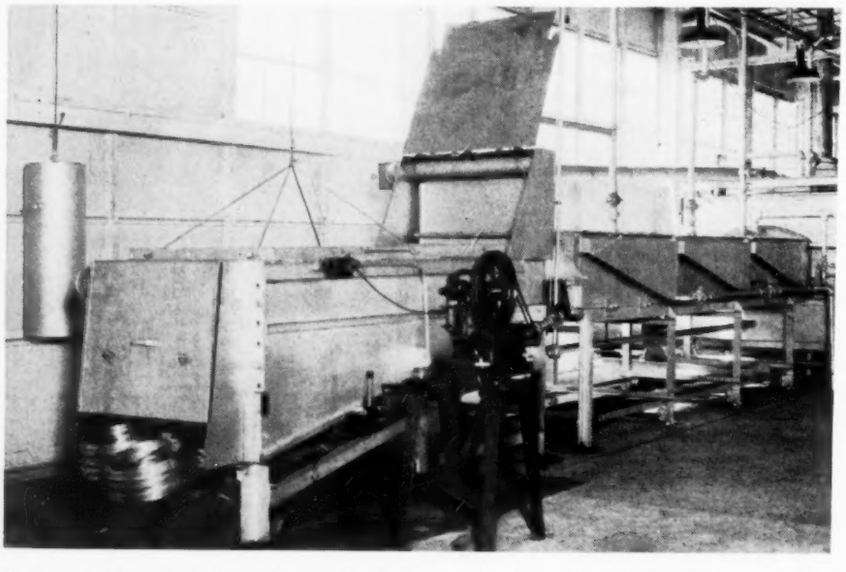
Controlled-Atmosphere Furnace for Bright Annealing Copper Tubing

BRIGHT annealing of copper and brass tubing has been improved upon greatly, in recent months, due to the insistence of refrigerator manufacturers for a bright product with no discoloration and a more uniform quality in grain structure. Not only is this improved process responsible for a materially better tube, but also for considerably lower production costs. In addition to this, rejections, formerly of rather large proportions, have been reduced to an almost negligible quantity.

This improved process has been adopted by the Linderme Tube Co., Cleveland, which manufactures a complete line of copper and brass seamless tubing, ⅛ to 2 inches in diameter, together with aluminum tubing, but the greater portion of its output is for the refrigerator industry.

The company, as mentioned previously, has recently installed modern bright annealing equipment, to meet the increasingly stiff specifications exacted by refrigerator makers. These included increased malleability, better grain structure, great uniformity in gage, wall thickness, etc., and a bright, clean product with no indication of tarnish, stain or scale. Particularly were they interested in the inside of the tube, specifying a 100 per cent dehydrated tube, as the least trace of moisture caused corrosion.

All these demands were met by equipment developed, designed, built and installed by the Surface Combustion Corp., Toledo, O. It consists of a continuous furnace which is automatic both as to operation and temperature control. It is equipped with an alloy muffle and the product is annealed in a special atmosphere, provided by a "DX" unit, also developed and put on the market by Surface Combustion. Copper and brass tubing, in coils or straight lengths, are treated in this furnace.



Copper tubing emerging from discharge end of controlled-atmosphere bright annealing furnace

The furnace is built of steel plates and structural shapes and the sidewalls and arch are lined with 4½ inches of refractory firebrick, backed by 4½ inches of insulating brick. The bottom contains 6 inches of each of these materials and the whole is mounted on legs. Approximately 29 feet in length, it is divided into a 9½-foot heating zone and a 19 1/3-foot water-cooled cooling zone with removable cover plates. The muffle through which the work passes consists of cast alloy sections, with flanged connection between, within the heating zone, and these rest on alloy rollers supported by brick piers. The cooling zone is an extension of this muffle, constructed of welded steel plates, and is equipped with a 1-inch water space for controlled cooling. This portion of the muffle is supported on a structural steel table.

Alloy Mesh Belt Is Used

The work is carried through the furnace and muffle on an alloy mesh belt 30 inches wide, suspended between pulleys at either end, far enough removed to allow space for loading and unloading. This belt, of course, is motor driven through a variable speed drive and returns in the space below the furnace. The muffle is provided with heat seals at each end to maintain the atmosphere inside.

The heating zone has 16 Surface Combustion standard tunnel gas burners, so located on the side walls as to fire both above and below the muffle. These burners are provided with low-pressure inspirators, and the combustion system operates on an air pressure of 16 ounces while the gas is at 6 inches water pressure. The desired temperature is maintained automatically by a potentiometer-type controller operating a motor valve of the on-and-off type, in the air supply line. There is also a recording pyrometer.

As stated, a special atmosphere is delivered to the muffle by a "DX" unit, standard equipment available in capacities from 500 to 15,000 cubic feet per hour. This unit reforms city gas, after it has been mixed with a limited quantity of air, and then washes the mixture, dehydrates it and cools it. This gas when reformed by combustion and prepared for the muffle, contains no oxygen or moisture and is uniform and clean.

This new process of bright anneal-

WE MADE THE SPOKES AND RIMS FOR GRANDPA'S BIKE

Eight . . . nine . . . even ten miles an hour! Gosh, how he burned the dust! Speed was in the making. Stronger! Safer! Lighter! Such were the cries of the day . . . so we replaced ash and oak with STEEL. True, spokes were pencil thick and rims were clumsy. They were just the beginning. Today, bicycles, motorcycles, automobiles and airplanes, most modern of the modern, use Wissco Wire and Wissco Strip of unbelievable strength, perfect in section and finish. Wissco Wire has developed with, and even ahead of product requirements. Don't you want to know of the Wissco Wire that's awaiting your demands?

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Wickwire Spencer manufactures High and Low Carbon Wires—in various tempers, grades and finishes—or your specific purpose. Hard-Drawn, soft or annealed Basic or Bessemer Wires—Hard-Drawn annealed, or oil-tempered Spring Wire, Chrome Vanadium Spring Wire — Valve Spring — Music — Clip — Pin — Hairpin—Hook and Eye—Broom—Stapling—Bookbinding—Machinery Spring Wire—Reed Wire — Clock — Pinion — Needle-Bar—Screw Stock—Armature Binding—Brush—Card—Florist—Mattress — Shaped — Rope — Welding. Flat Wire and Strip Steel, High or Low Carbon—Hard, annealed or tempered—Clock Spring Steel—Corrosion and Heat Resisting Wires. Consult the Wissco technical man on your wire problems, however large or small.

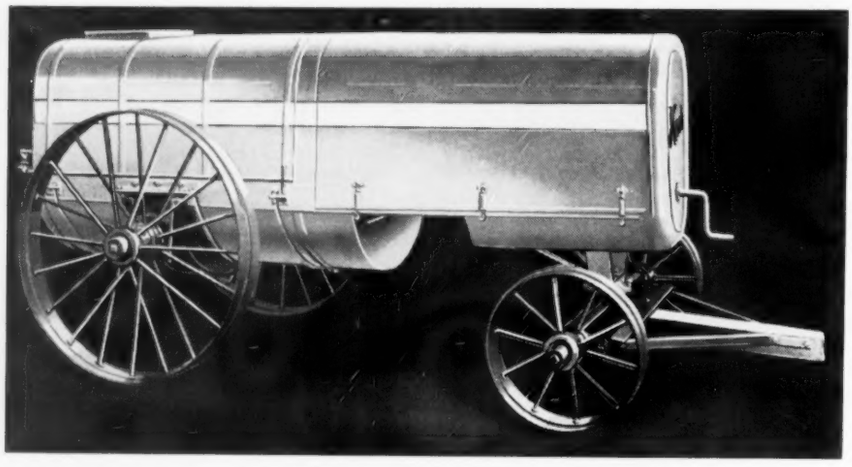
WISSCO WIRE
by Wickwire Spencer

ing furnishes an improved product and provides a saving in labor, fuel consumption and floor space, and eliminates pickling between draws. Work weighing 4250 pounds with 2609 pounds of belt was heated in this furnace to 1200 degrees Fahr. during a test lasting 7½ hours, an average of 914 pound of gross work treated hourly. Gas of 1000 B.t.u. heating value consumed in 7½ hours amounted to 4100 cubic feet, a gas consumption of 0.597 cubic foot per pound of gross work treated. The water cooled jacket on the cooling zone used approximately 46 gallons of water per hour.

Steel Tanks on Orchard Sprayers

FOR THE first time since the organization of the Hardie Mfg. Co., Hudson, Mich., 37 years ago, this company is featuring steel tanks in its line of orchard sprayers. Heretofore the tanks containing the spray solution have been entirely of wood. The change to steel was made because steel construction is more durable and compact and also because steel lends itself to streamlined design. This feature is important for the reason that projecting parts, sharp angles and rough lines on the sprayer cause destruction of fruit and damage to trees. Branches of trees slip easily along the smooth sides of the new steel sprayer tanks without injury.

An all-steel hood is used to protect the sprayer pump and engine; it prevents dust, dirt and spray material from getting into the operating parts. The hood is so designed as to continue the lines of the tank, making the entire outfit smooth and symmetrical. The truck of the new Hardie sprayer is of all-steel construction. All axles are equipped with steel roller bearings, the wheels are of steel to withstand shocks incidental to operation over rough ground and stainless steel and hardened steel parts are used in the pump valves.



Steel tanks have supplanted wood in this orchard sprayer, with resulting improvement in design. The sprayer now is of all steel construction

New vacuum cleaner is styled in the modern manner and is constructed of carefully selected materials

Vacuum Cleaner in Modern Style

MODERN styling is incorporated strikingly in a new vacuum cleaner, shown in the accompanying illustration, designed by Henry Dreyfuss,New York, and manufactured by the Hoover Co., Canton, O.

Materials for the construction of this cleaner have been selected with unusual care. One notable feature is the fabrication of the handle from duralumin. Also the fabricated alloy steel bail on the new cleaner represents an unusual accomplishment from the design and manufacturing standpoint owing to the problem of obtaining proper bail length and still keeping weight at a minimum.

Details of Design

The main casting or body is an aluminum alloy die casting highly polished. The alloy steel ball is chromium plated. The agitator shell and motor shell are aluminum alloy die castings. Agitator bearing and the motor ball bearings are of alloy steel. The agitator beater bar is of alloy steel, case hardened and nickel plated. The motor shaft is of carbon steel. The motor and armature punching is of electrical sheet steel. Belt and handle grip are of rubber.

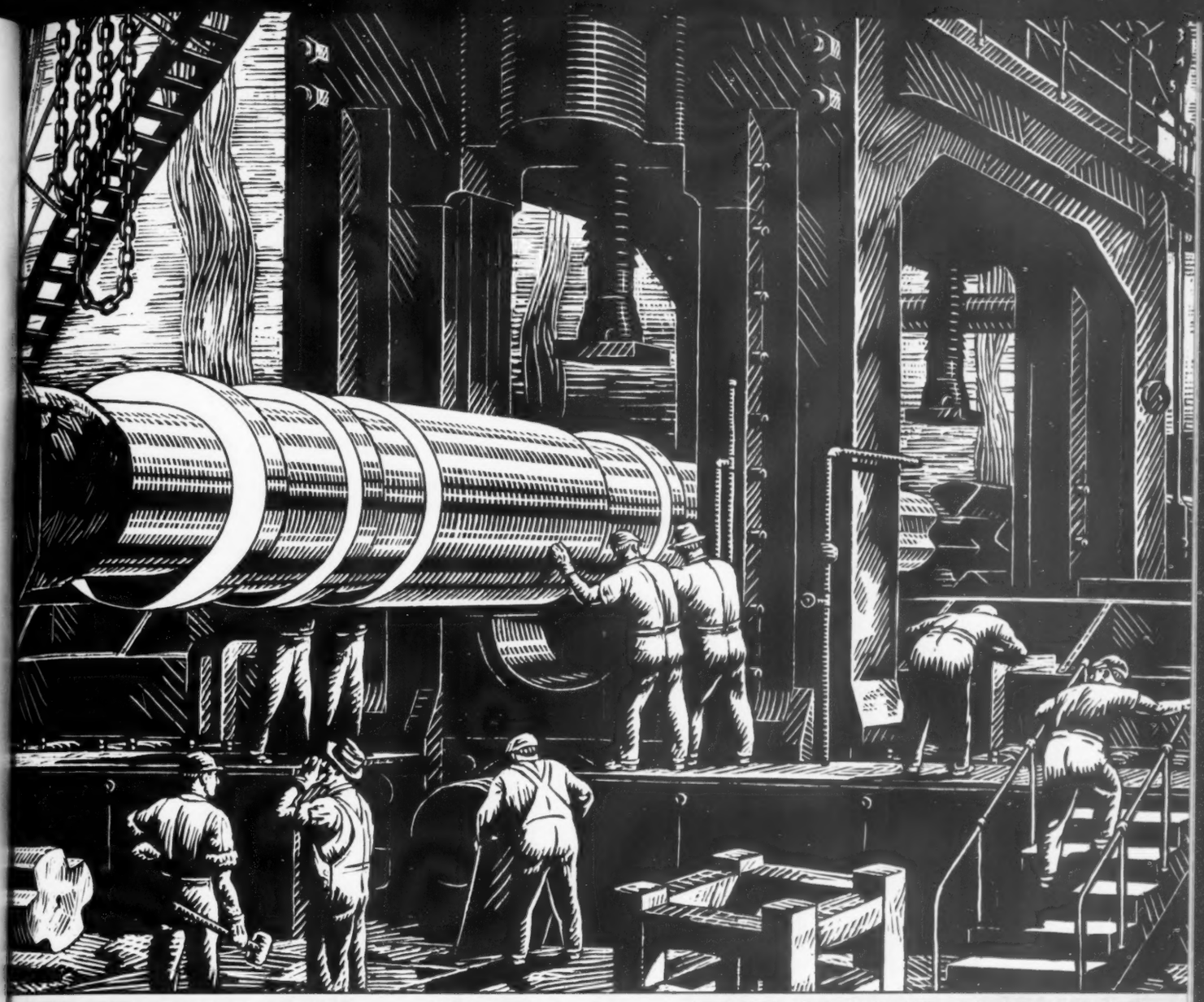
Decorative values are obtained not only by the design and by the use of highly polished surfaces but also by the use of contrasting colors. The nameplate is of black enamel and silver with the lettering of the slogan "It Beats as It Sweeps as It Cleans" in silver on black ground. Lettering of the name "Hoover" is in red on silver ground. Similar treatment is given to other lettering. The bag is of black cloth with fine white dots, giving a dark grey effect. On a broad black band near the top of the bag, the name of the manufacturer is lettered in red. Decoration of the horizontal lines extending the length of the bag is done in silver.

Steel Piling Is Given New Use at Unloading Dock

A newly developed use of steel piling, in harbor and dock improvements and shore protection work along our inland waterways, has been reported recently in the steel pile clusters that the S & W Construction Co., Memphis, Tenn., is building for Jones & Laughlin Steel Corp. at the latter's warehouse unloading dock in Memphis.

Design of these units marks a complete departure from the usual wood pile cluster in that the construction is of steel piling driven in the form of a cylinder and filled with either concrete or sand and gravel. In this particular project, a J & L section is being used. The cylinders have an inside diameter of 7 feet 1½ inches and are to be filled with sand and gravel. They are being constructed on the up-stream side of two existing concrete foundations of an overhead crane runway. In this location they serve a double purpose. They provide an indestructible protection for the concrete piers and are also used as dock clusters for mooring.

Application of steel in this type of



MODERN ROLL TECHNIQUE

Modern Roll technique as practiced by Pittsburgh Rolls Corporation is more than a way of doing a thing, it also includes such old-fashioned virtues as believing that an important element in the production is the honor, good faith and reputation of the maker. Pittsburgh Rolls employees guard this reputation jealously and zealously.

PHOENIX ROLLS

PHOENIX STEEL, for unusual strength; PHOENIX "A" (steel alloy), for strength and wear; PHOENIX METAL—PHOENIX "K", for strength, wear and finish; PHOENIXLOY (uniformly hard), for flat rolling where high finish of extremely thin gauge of material is required to be free from all marks or defects. PHOENIX CHILL; PHOENIX NICKEL CHILL; for all flat rolling requiring finish. Also tube mill rolls of quality material best suited to the kind of service required.

PITTSBURGH ROLLS CORPORATION

PITTSBURGH, PA.

work along inland waterways offers new opportunities for economies in the maintenance of these structures themselves, as well as the properties they support or protect.

Advantages claimed for the steel and concrete dock include greater safety factors, better appearance, increased resistance to damage resulting from collision and greater resistance to deterioration from erosion, all of which means a more durable structure, which through long life, will effect important savings for the owner.

Milwaukee Foundrymen in New Chapter of A. F. A.

More than 100 foundrymen of the Milwaukee district, meeting at Hotel Schroeder, Milwaukee, Nov. 8, organized the Milwaukee chapter of the American Foundrymen's association. W. J. Grede, Liberty Foundry Co., Wauwatosa, Wis., presided as organizing chairman. Dan M. Avey, editor of *The Foundry*, and president of the American Foundrymen's association, spoke on the purposes and opportunities of the association in relation to local chapter activities.

Officers were elected as follows: Chairman, W. F. Bornfleth, Cutler-Hammer Inc.; vice chairman, L. S. Peregoy, Sivyer Steel Casting Co.; secretary C. A. Gutenkunst Jr., Milwaukee Malleable & Gray Iron Works Inc.; and treasurer, W. J. Donnelly, George H. Smith Steel Casting Co.

The following were named directors: George Miller, Loeffelholz Co., C. S. Anderson, Belle City Malleable Iron Co., Racine, Wis.; A. C. Ziebell, Universal Foundry Co., Oshkosh, Wis.; W. J. MacNeil, Federal Malleable Co.; E. L. Roth, Motor Castings Co.; R. S. MacPherran, Allis-Chalmers Mfg. Co.; and W. J. Grede, Liberty Foundry Co., Wauwatosa.

F. A. Jensen, consulting engineer, Chicago, addressed the chapter on four years' experience building and directing foundries in Russia. A total of 84 foundries all completely modern gave background to the observations by the speaker. He commented on the difficulties attending the use of pig iron which varied in analysis widely.

Obtains 750 Per Cent Increase in Die Life

A manufacturer of porcelain insulators who had trouble with his die costs recently changed to a die steel which has resulted in increasing the life of his forming dies by 750 per cent. The steel giving this satisfactory service contains 2.20 per cent carbon, 12.00 chromium, 0.50 cobalt and 0.80 vanadium.

WELDING, et cetera . . .

BY ROBERT E. KINKEAD

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Someone May Be Doing It

Conservative engineers in the car departments of the railroads have expressed some misgivings on the question of whether welded steel freight cars will stand the banging around this equipment gets in service. These gentlemen are apparently unaware of the fact that some thousands of miles of main line track have battered rail ends welded, and that they stand about the worst abuse of metal used anywhere.

Metallurgically, welding air-hardening chromium steel to 0.60 per cent carbon steel rails by local application of the melting temperature is a nightmare. Subjecting such a weld to the impact of locomotive wheels at 70 miles per hour might be expected to crack out the welded area the first time a locomotive passed. The fact remains, however, that these built-up rail ends give satisfactory service.

Until a few years ago automotive engineers thought automobile frames had to be riveted so that they would have some "give" to them. Many car builders now weld cross members into the frame to take the "give" out of them to keep squeaks out of bodies and make them last longer. A prominent car builder used a cast iron cylinder block which foundrymen said could not be made in a foundry. The manufacturer got away with it because a welding man showed him how to weld defects and machine the casting without annealing.

Theorists about welding should take a good look around and then whisper if they must say, "It can't be done."

Selling

The welding industry does some heavy hitting when it undertakes to do its selling job. A new application of welding is discovered. The firm which discovered it gets its engineers and experts on the job. One day an official of the company walks into the office of the prospective customer and tells him what welding will do for him. More likely than not, the official will offer to put the equipment in the prospect's plant, operate it, and prove that his figures on economy are correct. As soon as these figures are proved correct, the prospect is obligated to buy. This kind of selling is good business, but it is no game for beginners in the welding industry.

Ideas

A firm of manufacturing engineers in Cleveland uses welded rolled steel in the manufacture of machinery for sugar refineries. This manufacturer adopted welded steel construction more than 20 years ago.

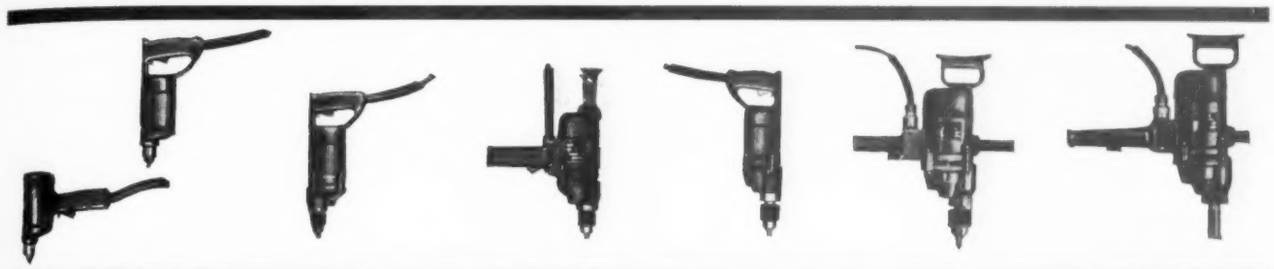
Due to this fact and the prompt adoption of other new and useful ideas, the firm competes successfully with other firms in the same business all over the world who are, for the most part, located in sugar producing countries. The general manager is 65 years young and counts that week lost in which he does not get a new idea of how to better his product.

Recollections

George Knotts, manager of the Youngstown, O., plant of United Engineering & Foundry Co., recalls a welding practice in a plant of which Charles M. Schwab was manager. Puddling bars were welded together by connecting them to the lighting generator through a water barrel rheostat. The ends were touched to start an arc and a second or so later the molten ends were pushed together and the joint forged on an anvil. Thus the Water Barrel Rheostat Club of the welding industry acquires a new member in Mr. Schwab.

New CP UNIVERSAL ELECTRIC DRILLS

Designed and Built FOR THE TOUGHEST PRODUCTION WORK

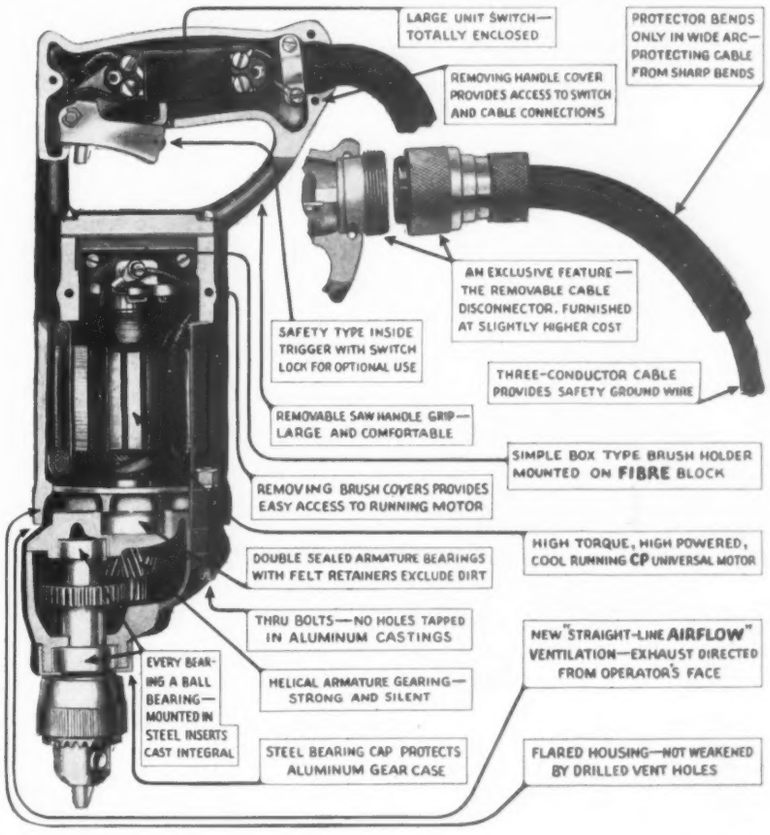


The types of CP Universal Electric Drills shown above are but representative of the complete line now available for metal and wood drilling from 3/16" to 1" capacities.

These new drills are real production tools . . . definitely designed and built to withstand hard, heavy duty, continuous application . . . and to deliver more and better work at a lower maintenance cost than ever before possible.

The adjoining sectional view of a Pistol Grip Type of CP Universal Drill shows general features of design and construction which are typical of the entire line. Complete details are available in a special bulletin—No. 899—just published. Send for your copy . . . now.

TYPICAL CONSTRUCTION CP UNIVERSAL HEAVY DUTY PISTOL GRIP DRILLS


LARGE UNIT SWITCH—TOTALLY ENCLOSED
PROTECTOR BENDS ONLY IN WIDE ARC—PROTECTING CABLE FROM SHARP BENDS
REMOVING HANDLE COVER PROVIDES ACCESS TO SWITCH AND CABLE CONNECTIONS
AN EXCLUSIVE FEATURE—THE REMOVABLE CABLE DISCONNECTOR. FURNISHED AT SLIGHTLY HIGHER COST
SAFETY TYPE INSIDE TRIGGER WITH SWITCH LOCK FOR OPTIONAL USE
THREE-CONDUCTOR CABLE PROVIDES SAFETY GROUND WIRE
REMOVABLE SAW HANDLE GRIP—LARGE AND COMFORTABLE
SIMPLE BOX TYPE BRUSH HOLDER MOUNTED ON FIBRE BLOCK
REMOVING BRUSH COVERS PROVIDES EASY ACCESS TO RUNNING MOTOR
HIGH TORQUE, HIGH POWERED, COOL RUNNING CP UNIVERSAL MOTOR
DOUBLE SEALED ARMATURE BEARINGS WITH FELT RETAINERS EXCLUDE DIRT
THRU BOLTS—NO HOLES TAPPED IN ALUMINUM CASTINGS
NEW "STRAIGHT-LINE AIRFLOW" VENTILATION—EXHAUST DIRECTED FROM OPERATOR'S FACE
EVERY BEARING A BALL BEARING—MOUNTED IN STEEL INSERTS CAST INTEGRAL
HELICAL ARMATURE GEARING—STRONG AND SILENT
STEEL BEARING CAP PROTECTS ALUMINUM GEAR CASE
FLARED HOUSING—NOT WEAKENED BY DRILLED VENT HOLES

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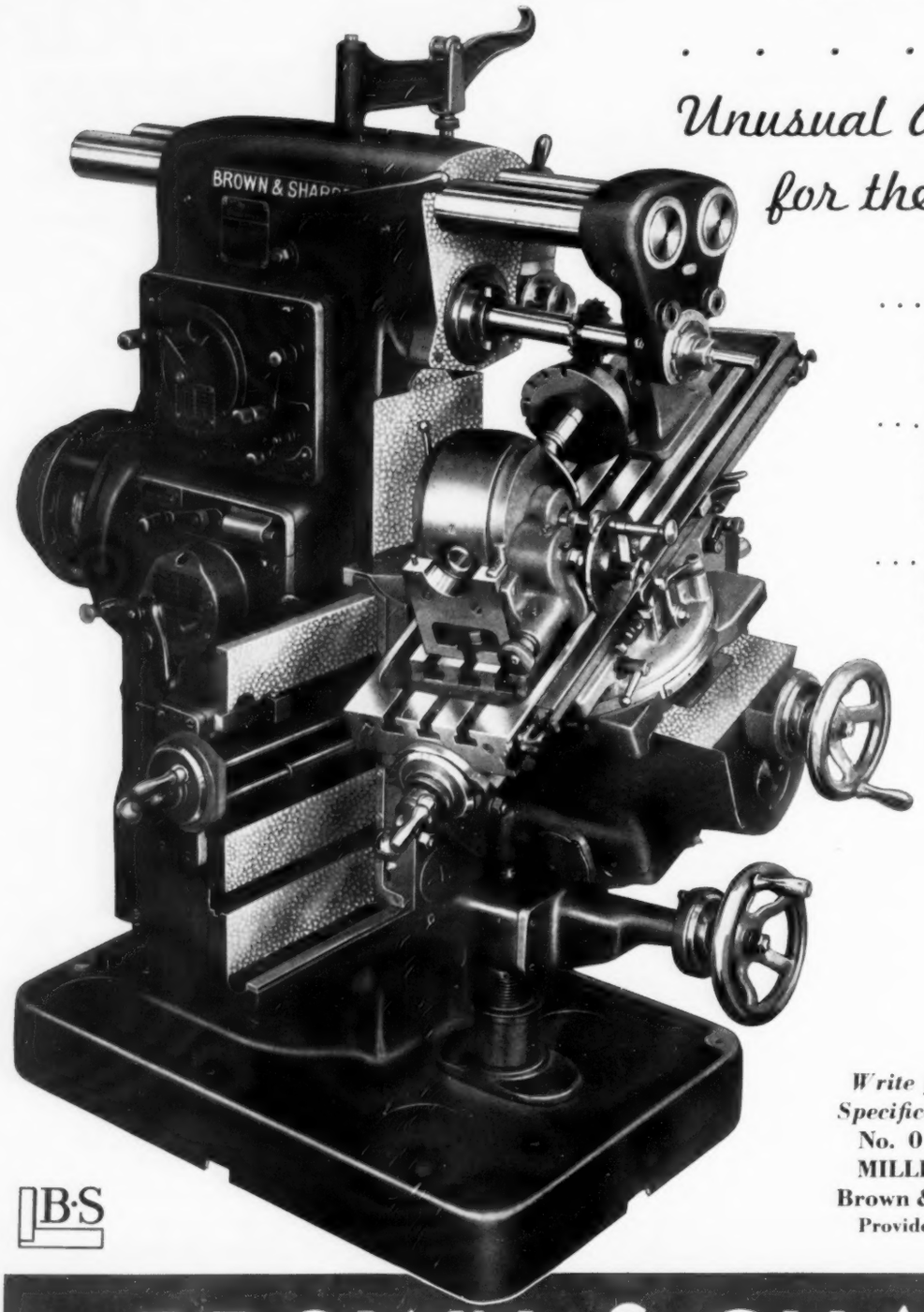
New in Design . . . . . with Unusual Advantages for the Toolroom



. . . Provides an easy and accurate method of obtaining both simple and compound angular settings for Milling or Boring Operations.

. . . Widened sphere of usefulness through the Universal Milling Attachment with Crane—thus providing an auxiliary spindle that can be set at any angle horizontally or vertically.

. . . Valuable for Manufacturing Departments on short run work that would not justify fixture expense for obtaining accurate settings for relative surfaces.

Write for Bulletin and Specifications of the New
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Brown & Sharpe Mfg. Co.
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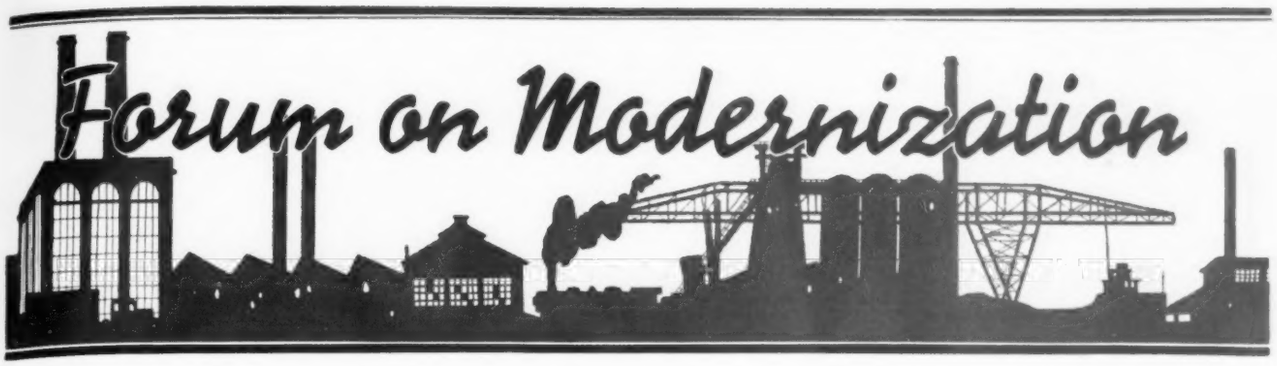


Alert Manufacturers Will Keep in Step with March of Modernization

BY T. H. DOAN

President, Foote-Burt Co., Cleveland

FROM my standpoint as a machine tool builder, modernization is much more than a catchword for differentiating in a general way between the old and the new. It signifies a general course of action by which all manufacturers maintain their right to stay in business. It denotes the process by which they protect themselves against withering blasts from competition and by which they enable themselves to make products which win distribution on the basis of quality and price.

In fact, failure to modernize, short of miraculous interventions, can only mean ultimate demise of the business.

Where Management Is Remiss

A few days ago a friend told me of an experience he had soon after the Machine Tool Show in Cleveland. He was interested in a company about to be reorganized. At a stockholders' meeting which was called to consider the reorganization plan, approximately 70 per cent of the time was consumed in discussing the lessons disclosed at the Machine Tool Show. It was shown that the reorganization of the company could not be completed unless, as the management explained, the plant equipment also were reorganized. This conclusion was based on reports by men in the manufacturing organization who, after attending the show, expressed the opinion that the company would not be able to compete in the open market with products manufactured with its present equipment. Without modernization, it was shown, the business was doomed.

Much trouble has been encountered in the past from the inability of factory men to sell to the higher executives the fact that new equipment was needed. In many cases they have realized that their equipment was in a deplorable state, but without being able to do anything about it. Such an attitude on the part of the management constitutes a liability which no amount of acumen by the manufacturing organization can offset.

What a Banker Should Ask

If I were sitting in a banker's chair today and the head of a manufacturing company approached me for a loan, one of the first questions I would ask would be: "What percentage of your equipment is five years old; what percentage is over ten years old?" The answer, in my mind, would determine quickly whether the company were progressive and in a position to maintain a market for its product by meeting competition.

During the Machine Tool Show our company purchased a large grinder which may be cited as an example of what modernization means. With this new grinder we are able to do in 3½ hours certain work which by an old method had consumed 22 hours.

Since then we have been able to develop another application for this new grinding machine. Formerly we planed and finish scraped a certain cast iron slide. With the new machine we are able to finish grind the slide to such a perfect surface that the scraping operation is eliminated entirely. We secure a much more accurate slide and in addition save 9 hours in the production time.

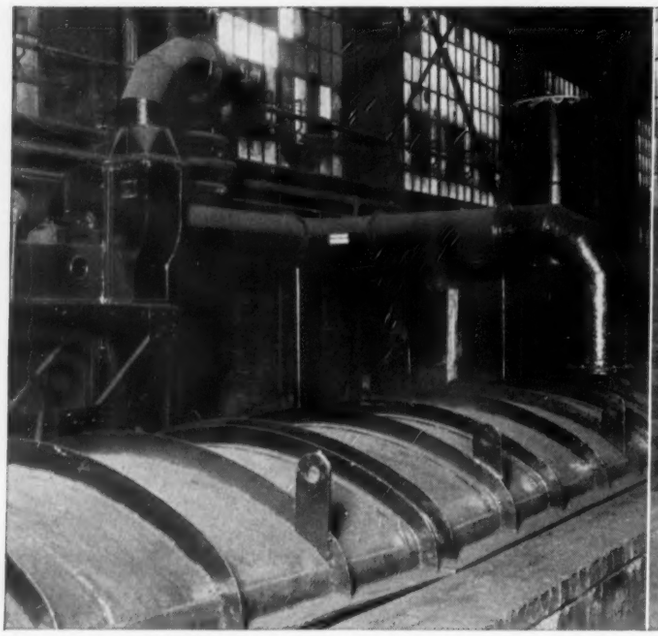
In fact, our company has been modernizing all through the depression, to the extent warranted by the volume of business we have been able to book. Money invested in new equipment has returned us a higher rate of profit than we have been able to get in any other way.

Two Machines Supplant Eleven

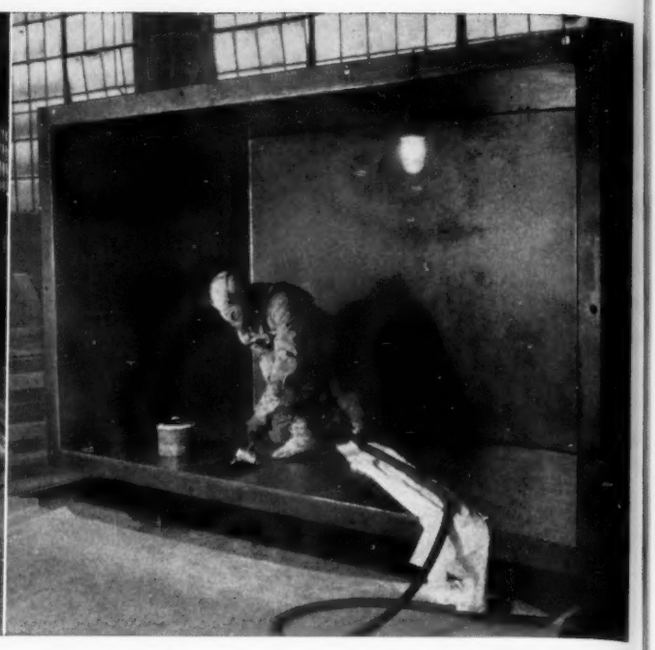
An example of what is possible along lines of modernization is afforded by the great progress made recently in the development of surface broaching. Of late this method of finishing has been applied to many operations. Recently we furnished two machines to a prominent automobile manufacturer for use in broaching off the ends of front wheel, knee action springs. These two machines supplant eleven grinding machines and the number of operators on this job was reduced from eleven to two. In addition, the tool expense was cut by 90 per cent.

In the above development a record dating back to 1910, which I had regarded as unique for all time, has been equaled. In that year we developed a 4-way drilling machine which at one setting drilled 45 holes in the top, bottom and two ends of a Ford motor block. Previously seven operations had been required to drill these holes.

Modernization moves on. What was seen at the Machine Tool Show marks an epoch. No manufacturing company can afford to ignore the profit making possibilities of modern equipment—if it expects to continue in business.



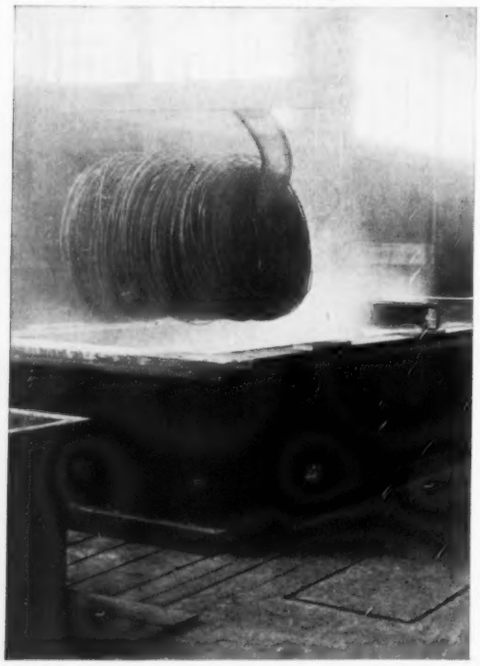
For three years, this user has had Goodrich-lined tank covers, Goodrich-lined ventilating fans, Goodrich rubber-covered carrier rolls . . . and has had no maintenance expense.



One part of the answer to the question: Why do Goodrich tanks never leak? One step in the Vulcalock Process, by which Triflex rubber is bonded inseparably to steel.

Goodrich Rubber Tank

ideal for new Electrolytic



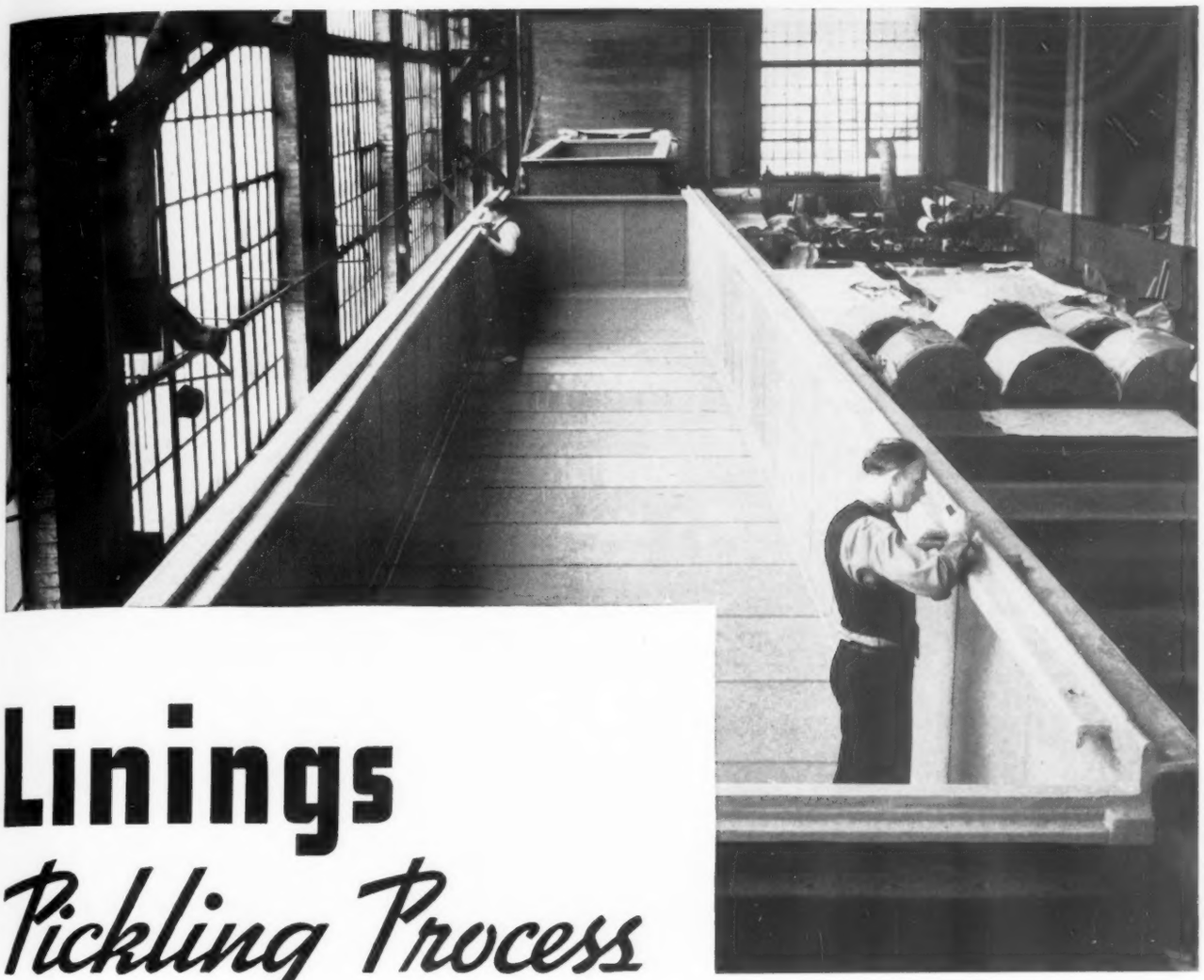
Whatever pickling method you use, or intend to use, you can eliminate worry and expense by the use of steel tanks with Goodrich Rubber Lining—the pickling tank of tomorrow, saving money for its users today.

BECAUSE it increases production, electrolytic pickling is a development every steel man should weigh carefully. One of these days you may want to equip your tanks for it. Since Goodrich rubber-lined tanks are best for electrolytic work and are easiest to change over, order Goodrich for the next tanks you buy, and be prepared.

Goodrich rubber lining completely insulates the steel tank in which it is used. And since Goodrich tanks are lined with Triflex rubber (a layer of hard rubber vulcanized between two layers of soft rubber and fitted with expansion joints) they cannot leak—the bottom of the tank and floors will always be dry and so prevent electrical leakage.

The electrolytic process increases the vigor of the acid, yet in its most active state the acid has no harmful effect on Goodrich

Goodrich



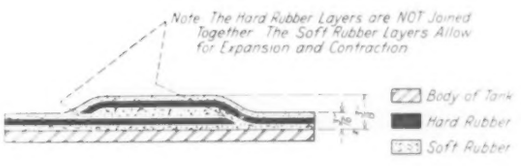
Linings

Pickling Process

Best for the service, easier to change over . . . Goodrich-lined tanks are ideal for electrolytic pickling.

rubber. You can expect the same years of trouble-free service from Goodrich tanks used in electrolytic work as users have always had from Goodrich tanks in the past.

Of course you won't have to wait until you change to electrolytic pickling to see your savings from Goodrich rubber. These tanks stop all acid leakage at once. They reduce tank maintenance to a trifle. They prevent shut-downs now caused by tank repairs. Whatever pickling method you use or intend to use, Goodrich tanks will give you lower pickling cost per ton. For data to prove it, for prices (you'll find them moderate), and for a sample of the interesting Triflex lining, write The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio. (In Canada: Canadian Goodrich Co., Ltd., Kitchener, Ont.)


Note: The Hard Rubber Layers are NOT Joined Together. The Soft Rubber Layers Allow for Expansion and Contraction
Body of Tank
Hard Rubber
Soft Rubber

Rubber Lining

ALL *products problems* IN RUBBER

Open-Hearth Steel Melting Discussed by Metallurgists

FOLLOWING the custom of the past several years, one session of the annual convention of the American Society for Metals held in Chicago, Sept. 30-Oct. 4, was devoted to steel melting problems. Three papers were read and discussed at this session on Oct. 4; the subjects were open-hearth temperature control, effect of deoxidation on the rate of formation of ferrite in commercial steels, and equilibrium in the reaction of hydrogen with ferrous oxide in liquid iron at 2910 degrees Fahr.

In the paper on open-hearth temperature control, Earnshaw Cook, research metallurgist, American Brake Shoe & Foundry Co., Chicago Heights, Ill., discussed the calibration and use of optical pyrometers in steelmaking and suggested a workable system with reference to the limitations of instruments and melting practices. He presented operating data together with such items of plant practice as may be benefited by successful application of the methods.

Sufficiently accurate temperatures of molten steel may be obtained with optical pyrometers carefully standardized upon known, constant temperature points, stated Mr. Cook. While the actual temperatures reported are not important if they remain closely comparable, an approximate calibration may be obtained by reference to the known melting points of pure metals as observed in the open. The accepted emissivity for the apparent temperatures of molten steel might well be the subject of further investigation.

Set Temperature Limits

The freezing points of killed steel ingots offer a convenient means for checking the standardization of optical pyrometers under service conditions, the author said. Observation of the highest average tapping temperature, during the stage when the ladle is approximately half full, and the lowest readable pouring temperature at the third ingot, permits the development of a generally consistent system for open-hearth temperature control. Safe minimum tapping and pouring temperatures may be established for each grade of steel according to particular shop practices.

Control of pouring temperatures may be accomplished by holding heats in the ladle for a predetermined interval calculated from the initial temperature, length of tap, average temperature loss and the scheduled teeming temperature. Certain limitations of temperature control imposed by variable furnace practices were suggested by Mr. Cook, and he presented a practicable schedule of freezing, skulling and pouring temperatures based upon the reported system of calibration and observation. He also suggested possible operating advantages accruing to uniform temperature control.

In a written discussion, Gordon B. Wilkes, professor of heat engineering, Massachusetts Institute of Technology, Cambridge, Mass., stated that until there is more information concerning the emissivity of the surfaces involved in open-hearth temperature measurements, the true temperature as measured with an optical pyrometer will be uncertain, but the author's investigation has undoubtedly reduced this uncertainty considerably and has given some very useful pointers toward the more precise control of open-hearth temperatures.

Accounts for Discrepancies

It was the opinion of M. J. Bradley, Leeds & Northrup Co., Philadelphia, that the various methods and means employed to measure temperatures in the open-hearth process, combined with the uncertainties entailed in emissivity corrections for various conditions and the possibilities of superheating or supercooling, explains in a great measure the discrepancies encountered in relating reported temperatures for similar heats in different shops. It is desirable, especially from an operating standpoint, to be able to reproduce accurately a temperature relation for the same step in the process in similar heats.

Mr. Bradley said it is desirable also to be able to transmit temperature information from one shop to another in such a way that it will have the same meaning to all parties. To do this, it is important that the instruments be accurately calibrated against a common standard; the reading must be taken in the same way under the same conditions; and, if corrections to take care of non-black body conditions are applied the magnitude of these corrections should be stated definitely. It would be desirable also to be able to use the same calibration to measure temperatures of the steel during processing as well as in the molten condition.

It seemed unfortunate, said H. P. Munger and J. W. Poynter, American Rolling Mill Co., Middletown, O., that Mr. Cook disregarded almost all theoretical considerations in his calibration of the optical pyrometers. In any calibration of optical pyrometers, they contended, two points must be considered carefully, namely, that the temperature of the radiating source is constant and known, and that essentially black body conditions exist. When calibrating an optical pyrometer against the surface of a solidifying ingot none of these conditions is fulfilled.

As pointed out by the author, a solidifying ingot "possesses a progressive freezing range with the purer austenitic crystals separating out first" and this causes the calibration point to be very uncertain, since a 0.1 per cent carbon steel has a rather wide solidifying range. Moreover, said Messrs. Munger and Poynter, it is probable that the surface of the molten metal will become coated with oxide, which may be at a lower temperature, causing the results to be questionable. Under the conditions of the calibration, black body conditions would not exist unless the pyrometer was sighted in the crevice at the interface of the molten and ingot mold.

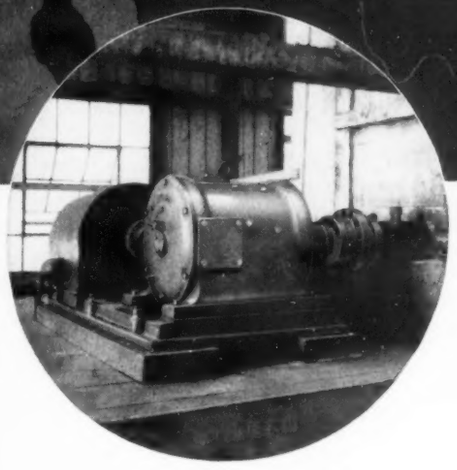
It is possible, they said, that temperature measurements using this method of calibration could be duplicated where a standard procedure is used at a single plant but it seems improbable that comparison of results between different plants using this method of calibration would be satisfactory.

Should Standardize Methods

Comparison of data in individual shops and particularly from different shops on tapping, teeming and skulling temperatures always has presented a problem because of various methods of calibrating, stated C. N. Treat, Republic Steel Corp., South Chicago, Ill. He said Mr. Cook had suggested a method which appears practical in application. Recommendations along these lines should be welcomed and tried. Emphasis should be placed on the absolute necessity of co-operation between production men, superintendents, melters and foremen, with technical men, metallurgists and observers. There must be a definite agreement as to the results desired, importance of these results and the methods to be used to obtain them. This is the first and most important step in control of any kind, declared Mr. Treat.

Effect of deoxidation on the rate of formation of ferrite in commercial steels was discussed in the paper by D. L. McBride, department of metallurgical engineering, and R. F. Mehl, professor of metallurgy, Carnegie Institute of Technology, Pittsburgh.

(*Please turn to Page 70*)



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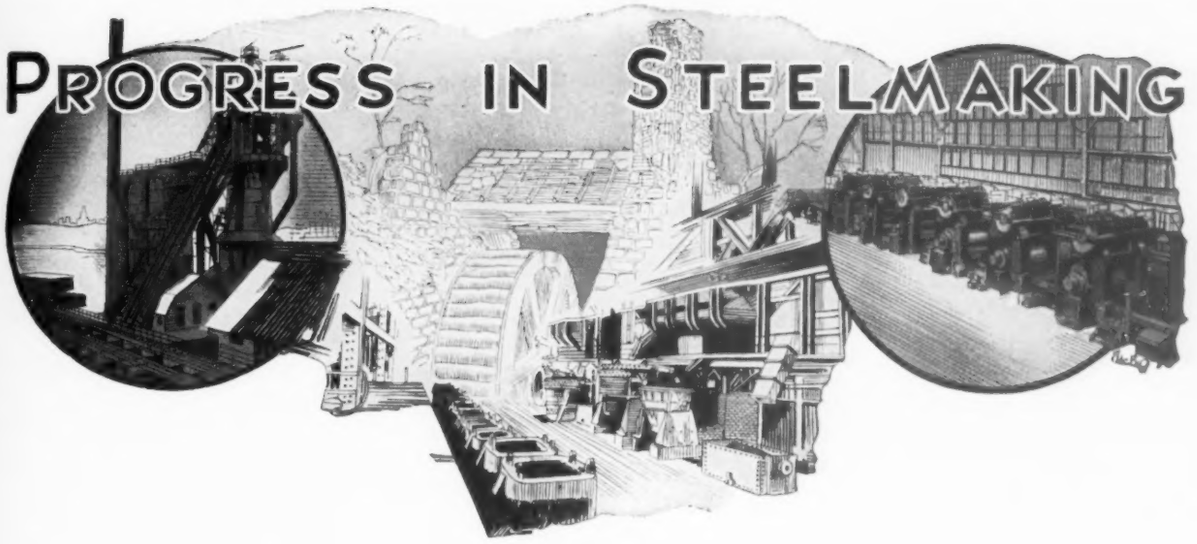

Measures Quantity of Oil

Changes in line pressure, temperatures and viscosities do not disturb the accuracy or performance of a thermostatic liquid meter now being employed at steelworks for measuring fuel oil. An accuracy of 1/10 of 1 per cent is maintained over a range of flow. The meter automatically compensates for expansion and contraction of the liquid being measured and records the liquid in units of gallons as of 60 degrees Fahr. When desired a device can be provided which supplies a true proportional sample as the liquid is measured. The unit is simple in design and while it embodies extreme accuracy in machine work, it requires no special attention. At one large steelworks the fuel oil is received to storage through one of these meters; the company also meters the fuel consumed by each burner used in the open-hearth and other steel producing departments. Consumption of some of these burners is as low as 10 gallons an hour; pressures are from gravity to 250 pounds . The temperature of the fuel oil ranges from 40 to 275 degrees Fahr.

• • •

Speeds Flow of Lubricant

Soil-heating cable made from nickel-chromium wire covered with asbestos, taped with varnished cambric and encased in a lead sheath for protection from moisture, now finds application in the steel industry. A steel plant in Ohio had difficulty in the winter months with its roll neck bearing lubricant which congealed in the pipe lines. A steam pipe or air duct nested with the pipe lines failed to keep the lubricant of the desired consistency. Soil heating cable was tried. The cable was wound around the pipes and then covered with insulating material. An automatic adjustable thermostat maintains the lubricant at the proper temperature so that it will flow to the roll neck bearing irrespective of the weather conditions.

• • •

Coating Resists Abrasion

A technical enamel coating of extreme hardness that withstands the abrasion of metal and heavy traffic and which can be applied to surfaces while damp and at the same time will not chip, peel, alligator or chalk, has been made applicable to steel. The product will withstand a temperature of 700 degrees Fahr. and may be applied in subzero temperature. The high content of carborundum powder in the enamel accounts for the severe abuse it will withstand under extreme conditions. The product may be used for coating concrete floors, metal roofs, structural steel, etc. and as a permanent priming coat to anchor any other paint on machinery, tanks, engines, roofs, etc. It also serves as a protection against destruction of steel work and ex-

Four Money-Saving Ideas

According to a new detinning process the operations are simplified and rendered less hazardous by using acetic acid instead of chlorine. The tin plate is heated in a closed chamber containing acetic-acid vapor; the tin is attacked, a white layer of small water-soluble crystals being formed on the surface. The iron base is not disturbed. While the acid reacts with the tin at ordinary temperatures, heating is desirable in order to increase the reaction. Formic acid also may be used in place of acetic acid.

• • •

Pickling department floors can be built acidproof by a simple method of construction. A concrete base 3 to 4 inches thick depending upon the type of service is laid down. When dry, the surface is brushed with hot asphalt. After this coating is cool enough to walk on, acidproof brick, which has been dipped in hot asphalt until one-half its thickness is submerged, is shoved into a point. Sufficient pressure should be used to effect a medium or small joint. Shallow joints are made full by pouring in a sufficient quantity of hot asphalt. When the floor is completed any excess coating is scraped off in order to provide a clean and smooth surface. Floors of this type will provide service for many years under usual pickling practice.

• • •

Cleaning tarnish, grease and dirt off the nameplate of motors and generators in order to read the figures and other data is facilitated by the use of a wad of crinkled tin foil. The nameplate is not scratched or marred by this material as is the case when an abrasive is used for removing the accumulated dirt.

• • •

Flaked graphite mixed with a medium grade of lubricating oil to form a paste and applied to the threads of screws and bolts facilitates the backing off of nuts and the removal of screws and machine bolts. The paste, which also is suitable for pipe joints, prevents rust.

haust systems by acids and alkali fumes.

• • •

Facilitates Handling Strip

Wooden skids now are being used by a Chicago producer to ship strip steel. The stock in coil form is securely fastened to avoid shifting in transit. By this arrangement handling is greatly facilitated inasmuch as the customer can unload the cars and transfer the stock to warehouse easier, faster and at less expense compared to former methods of handling.

Modern Sheet Mill in Australia Is Adapted to Diversified Products

SHEET production at the plant of Australian Iron & Steel Co., Ltd., Sydney, Australia, now is on a commercial basis, according to Dennis E. Benbow, formerly superintendent of the department. The plant at present is equipped with a 3-high water mill, a 2-high hot sheet mill and a stand of cold rolls. When business condititons and contingent departmental development will permit, the company plans to install another hot sheet mill and three stands of cold rolls.

In addition to producing light plates the 3-high mill also is supplying breakdowns for the 2-high finishing stand. A single stand of cold rolls is driven off the same drive as the 3-high and 2-high hot mills through a long spindle; a drag located on the crab side of the cold mill holds down the backlash.

The 3-high unit is served by a power-driven breakdown conveyor which is fed at the catcher's side of the mill and discharges near the rear of the pair furnace. By this arrangement heavy-gage material in long lengths is returned for reheating and finishing immediately after being worked to the limit of heat value in breakdown.

Elevated Conveyors Used

Crane service is reduced materially by providing an elevated breakdown conveyor extending the full length and beyond the pack furnace; it is located on the opposite side of the furnace to the conveyor used for returning the doubled packs to the charging end. The 3-high mill is provided with an automatic stacker for breakdowns; the lifts are removed in weights of 5 to 6 tons each and placed upon an elevated gravity-fed conveyor which transfers them to the rear of the pack furnace of the finishing mill in the schedule or cycle of charging. This conveyor curves to the rear of the furnace, permitting the sheets to be matched and placed upon the chains with little labor involved. By this arrangement the finishing mill is stacked with 30 to 40 tons of breakdowns at once, thus relieving the crane for other duties, while eliminating one handling of each lift entirely.

On the catcher's side of the 3-high mill a portable section of conveyor can be inserted in the space required for the stacker when the mill is working on breakdowns. This is connected to a permanent-driven conveyor with a roller leveler hook-up that conveys the sheets 135 feet to a set of gate shears located in the finishing building. The sheets after passing through the roller leveler, which is in a direct line from the catcher's table, are transferred by a tilting table onto another conveyor which carries them sidewise to the shears. This system under proper working cycles, eliminates the necessity of stacking heavy gage stock while hot. It also permits shearing with the mill and reduces handling costs to a material extent.

The 3-high mill is served by a 65-foot 2-sided Flinn-Dreffein furnace which is fired with raw producer gas. Mill and furnace are interchangeable for working pairs and packs. A specially developed link-chain device places the bars squarely upon the fingers of the furnace chain thus permitting a number of bars to be charged simultaneously. The mill is equipped with Lewis-type catching and roughing tables. The screw is operated with electrical screwdown of local design, with a ratchet attachment to prevent jamming; a presetter is in course of development. All rolls are driven through a 3-high pinion. The middle roll is equipped with a clutch to compensate for slippage and is provided with a throw-out to permit operation by friction. The middle roll is balanced by weights; the air automatically is controlled off catcher's table. The top and botttom rolls are 32 inches diameter and 54 inches long; the middle rolls are 18 inches diameter and by 54 inches long. Both steel and alloy rolls are used.

View of 3-high mill which is equipped with an automatic stacker for breakdowns

Capacity of Mill

The heaviest bar successfully worked and finished in one heating to date is 2 x 12 x 50 inches to a finished sheet gage 48 inches wide by 144 inches long.

The finishing mills which will take rolls 32 inches diameter and 38, 44 and 56 inches long, are equipped for finishing breakdowns only. They are of the conventional 2-high type with Aetna automatic top and bottom roll polishers, Wean feeding and catching tables and hand-operated screw. A water-cooled standing is provided around the doubling machine which is located on the catcher's side of mill. The doubled packs are conveyed to rear of furnace practically underground where a turn-table recharges them, for finishing.

All other departments follow closely in design, layout and type of equipment used, the style and cycle of practice followed by modern American mills.

Australia, in addition to the new sheet mill, has one of old standing rated at 80,000 tons capacity annually. The combined capacity of the two plants of around 130,000 tons per annum estabishes production close to present consumption in this branch of the steel industry.

High-Tensile Alloy Steel Galvanized Successfully

Engineers of the federal government at San Francisco are now designing a shallow-draft seagoing hopper dredge on which is specified the use of high-tensile steel known as Cor-Ten, produced by United States Steel Corp. subsidiaries, for use in the dredge's ventilators and cowls. The use of Man-Ten, another of the corporation's high-tensile group, has been specified for application on the hoppers of the dredge.

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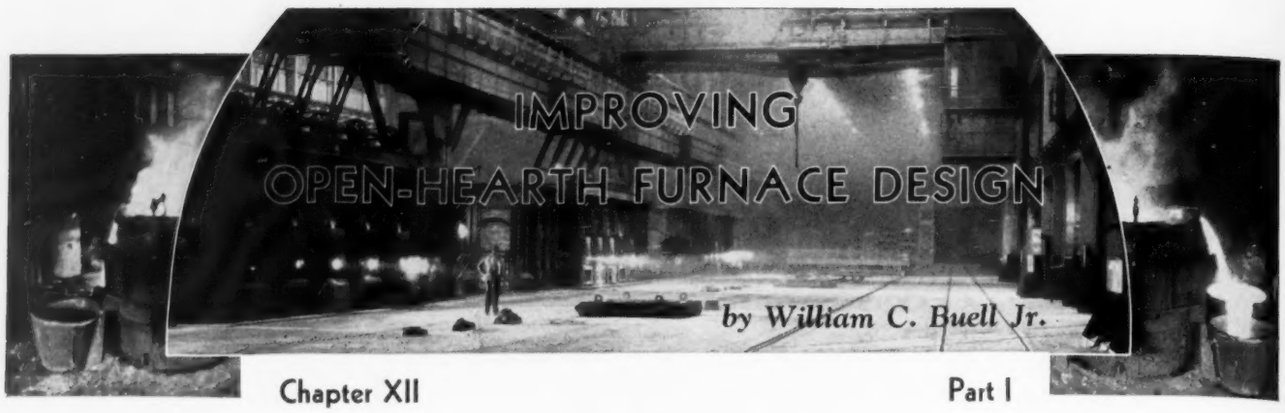

IMPROVING OPEN-HEARTH FURNACE DESIGN

by William C. Buell Jr.

Chapter XII — Part I

Valves

PRIOR to the invention of the regenerative furnace simple slide type valves operating either vertically or horizontally or flap dampers at the chimney tops had met successfully all of the elementary problems of furnace operation or control to that time encountered.

The necessity of periodically reversing the direction of fluid flow in the regenerative furnace introduced many new factors into valve design, among which were the requirement of positive seal against the flow of producer gas, quick operating arrangements in order to reverse the furnace rapidly, and methods of design that would develop satisfactory valve life with low upkeep costs.

Designs Various Valves

Of necessity Seimens designed a number of valves, all of which are supposed to have been of the butterfly-damper type. An early type of his design is illustrated in Fig. 188. The body of the valve consisted of refractory ducts around a butterfly damper. The many and obvious faults of this design will be apparent to all familiar with open-hearth operation. The final Seimens design, Fig. 189, was used to operate the early American furnaces, persisted for many years, and is yet occasionally found in service in connection with small or older furnaces.

The principal improvement of this later design over the earlier type is in the metal seats which will bring about a much greater degree of tightness as long as the valve is in good condition.

On account of its many weaknesses, several inventors made efforts to improve the Seimens butterfly valve in detail, but none offered sufficient betterment to displace the

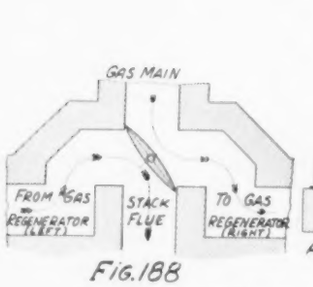

FIG. 188

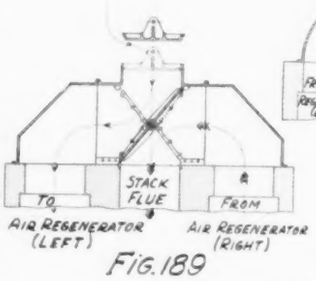

FIG. 189

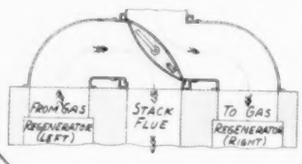

FIG. 190

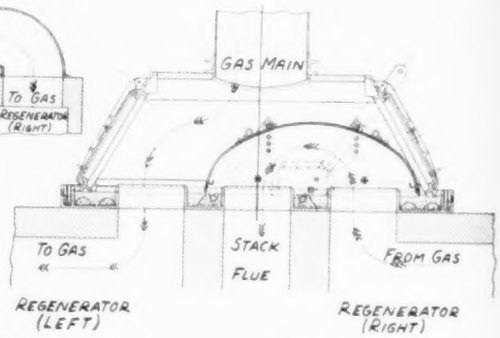

FIG. 191

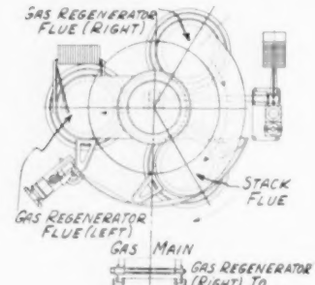

FIG. 192

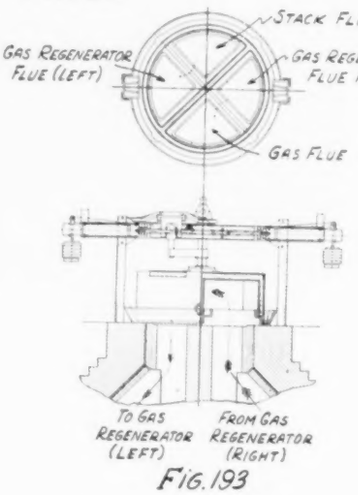

FIG. 193

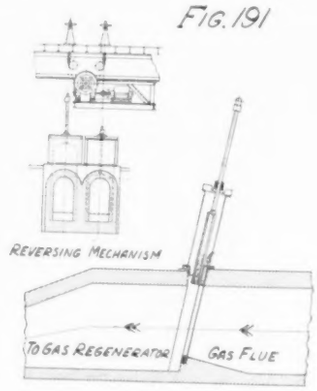

FIG. 194

Fig. 188—Early design of Seimens valve. Fig. 189—Final type of Seimens valve which occasionally is found in service. Fig. 190—Higgs valve, Seimens type, with water-cooled butterfly and seats. Fig. 191—Forter valve—original type with reciprocating hood. Fig. 192—Blair valve—lift and rotating type. Fig. 193—Dyblie bell type rotating valve. Fig. 194—Original type of Knox valve

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original. An example of such detail improvement is illustrated in Fig. 190. This is the Higgs valve, of the general Seimens type, but incorporating a water-cooled butterfly damper with water-cooled seats.

In the late nineties Forter patented the first American valve to have a positive closing effect through water sealing. This is illustrated, Fig. 191. As may be seen, Forter omitted the butterfly damper and in its place substituted a metal hood, which, when actuated with reciprocating motion connected the stack flue selectively with either of the regenerator flues, the edges of the hood dropping to enter a water-filled pan which caused an effectual seal.

This valve offered a material advancement to the practice and many installations were made. It was the forerunner of the present Wellman valve, which is lined entirely with brick and has an 8 or 10-inch water seal. The Wellman unit is the approved valve in preheated mixed gas operation.

The Schild, Nye and Isley reciprocating valves, all of which received some recognition, followed the general principles of the Forter design.

Shortly after the turn of the 20th century Blair patented a valve consisting of a cluster of mains and ducts, that would lift from the water sealing pan and rotate in either direction to register with the flues it was desired to interconnect in order to reverse a furnace. One of the later Blair designs is illustrated in Fig. 192. Fundamentally, similar designs later were offered by Schild and McKee. Valves of this type had a limited measure of application and success.

Dyblie secured the patent on his bell-type revolving valve, Fig. 193, about the same time as Blair and his original type later was modified and patented by McKeenan.

Other Types Are Patented

A number of other designs were patented and had a limited application in the United States, and many others were patented in Europe, in addition to the several valves illustrated or mentioned herein.

All of the valves shown in Figs. 189 to 193, are set at grade requiring that the several flues of the regenerators and stack systems and the producer gas main in the case of the Dyblie valve, reach the valves vertically from the under side. There, in their passage through the valves, the fluids must turn through 360 degrees of angularity that would be absent were vertical slide dampers used. In addition, the gases in passing through the valves come into contact with considerable areas of water-cooled surfaces and open water has a deleterious cooling effect particularly on producer gas. Bulmer* from the results of several tests reports that from 27 per cent in good installations to 72 per cent in poor installations of the total available chimney draft is absorbed when the above-ground type of valve is used.

The Kinney-McDermott heat balance shows a temperature loss of 305 degrees Fahr. through the producer gas valve system (Table CXXIX, lines 34 minus line 35). The valve in this case was a Dyblie.

Bulmer* reports an increase of waste gas temperature as high as 240 degrees Fahr. and in a test at one plant claims an increase of 20 per cent in the steam production of the waste-heat boilers when slide valves replaced the older types.

Impaired Operating Results

Draft losses of the magnitude cited seriously impair the operating properties of any furnaces; heat losses, such as those mentioned, represent an appreciable cost factor of operation.

Vertical slide dampers have been used from the earliest days of the open hearth in the stack flue, as an ancillary to the reversing valve system for the regulation of stack draft.

Thus, the patent of Schwab and James in 1886, Fig. 180, indicates that early in the development of the practice the desirability of the elimination of the above-ground type of valve was recognized. However, it seems that possible improvement in the vertical slide damper for use as components of the reversing system were overlooked or discarded as impractical, for not until 1914 did Knox design and patent the obviously simple and effective slide valve and seat that bear his name, and which today is invariably included in new construction, excepting for mixed gas operation, and is replacing the older type of valve as convenient.

The original Knox valve is illustrated in Fig. 194. The arrangement consists of two principal components, the slide and the seat, both water cooled and machined to a tight fit. The slight inclination of the setting of the valve is designed as sufficient to develop a weight in bearing greater than the pressure of the producer gas or the suction of the induced draft fan or stack, thus causing the slide to lay tightly on the seat and seal.

The original Knox valve as illustrated shows a hollow slide constructed of welded plate, completely filled with water. In later designs and in order to decrease the cooling effect of the water-cooled surfaces this is modified to show the welded water-cooled component to be constructed as an annular frame which is filled with firebrick. The best contemporary design is illustrated in

*"Gas and Air Valves for Open-Hearth Furnaces," by W. C. Blumer, Year Book American Iron and Steel institute, 1922.

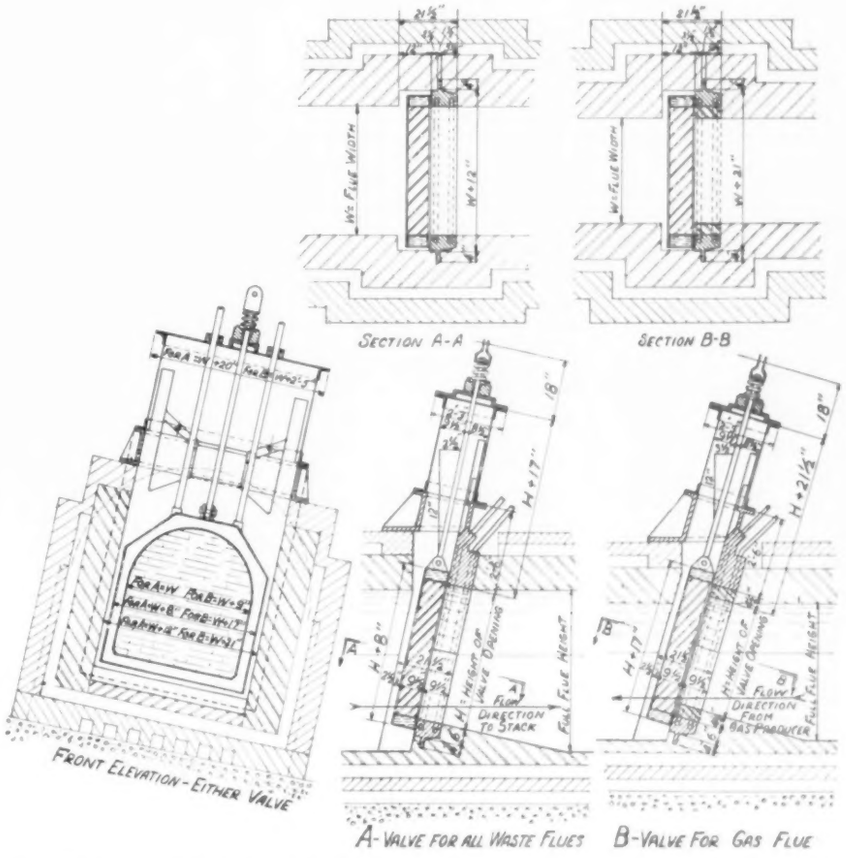


Fig. 195—Approved type of inclined valves with water-cooled slides and seats

Fig. 195-A. Such valves as illustrated are suitable for use as the reversing valves in both the waste gas and air flues. Several manufacturers now offer excellent valves and seats following the fundamental Knox design. If, in addition to their connection to the reversing mechanism the valves are connected suitably to floor stands, they then may be adjusted to equalize the draft or flow through the gas and air regenerators at each side, a valuable control.

Valve Slopes Toward Rear

The illustration of the valve under discussion shows the slide to slope backward along the line of flow and that the inclination is 2½ : 12 inches. The slope and its direction are important factors. The brick lined slide will weigh about 100 pounds per square foot of slide surface. The slope specified is nearly 12 degrees and the corresponding tangent is 0.208 which develops the slide to exert a force on the seat of 20.8 pounds per square foot of slide A draft of 1 inch of water is equal to 5.2 pounds per square foot which increases directly with the draft. Thus, if there is 2 inches water draft and the valve is set as illustrated the total weight of the slide bearing on the seat will be 20.8 + 10.4, or 31.2 pounds per square foot of slide.

If as occasionally is found, the valve is incorrectly set in the opposite direction to the flow, the total bearing on the seat will be 20.8 —10.4 or 10.4 pounds per square foot of slide, a considerable difference, and under some conditions certain to allow leakage. The effective bearing weight can be increased directly through a greater slope. This is shown, for various conditions in Table CXXXIX.

Table CXXXIX

Comparing Valve Slope with Bearing Weight on Seat

Slope, inches	Angle	Tangent	Bearing Weight,* lbs./sq.ft.
a	b	c	d
2 : 12	9°—27'44"	0.166	16.6
2½ : 12	11°—46'06"	0.208	20.8
3 : 12	14°—02'10"	0.250	25.0
3½ : 12	16°—15'37"	0.291	29.1
4 : 12	18°—26'06"	0.33	33.3

*Slide weighs 100 pounds per square foot.

The valve, Fig. 195-B is shown as modified both in construction and setting for use as the producer gas valve. In order to conserve all temperature possible, the opening through the seat has a 4½ inch thick firebrick lining. The seat thus has an opening 9 inches lower and 9 inches narrower than a seat of similar size for any other service. In order to prevent the passage of producer gas into the valve hood when the valve is closed, it is considered necessary to slope the valve with the direction of flow. In order to assure tightness the slope is increased to 3½ : 12 inches which increases the bearing weight to 29.1 pounds per square foot.

Sealing Pressure Satisfactory

As previously demonstrated nearly 2 inches producer gas pressure is necessary at A₂ and it will be reasonable to assume the pressure in the gas flue will be about 3 inches of water, or 15.6 pounds per square foot, leaving 13.5 pounds valve weight available for sealing effect. Usually this is found to be satisfactory but when leakage is known or suspected to exist, conditions as discussed here should be investigated.

While increasing the slope will improve conditions in the order indicated it may be necessary to further load a valve in order to secure satisfactory sealing, especially if producer gas pressures greater than 3 inches of water are necessary or developed in operation.

Has Self-Sealing Property

Principally from the action of entrained dust and tarry matter, raw, hot producer gas has the valuable property of self-sealing small openings. It is this property that permits the satisfactory use of the slide type valve for it is never possible to maintain the valves as here described at absolute tightness throughout a furnace campaign. Thus the slide valve will not be found satisfactory for preheated mixed gas practice and a type that seals positively must be used.

A type of valve that has been found particularly satisfactory for mixed gas operation is the Wellman, Fig. 196, when especially arranged to develop the 8 or 10-inch effective water seal necessary for operating with the 4 to 6 inches of water pressure usually existing in the fuel main. The installation of such a valve necessitates the arrangement of an above-ground setting of the waste flues (gas) but the operation of the waste flues (air) is continued with the slide type valve.

The air inlet valve and its seat should be constructed carefully and set into the masonry in order that exact control may be had of the air volume entering the system and to assure absence of leakage. Warped valves or those that otherwise do not seat correctly or tightly often are observed in the open hearth and such valves should not be tolerated inasmuch as deleterious effects on operation from poor air valves usually are considerable.

(To be continued)

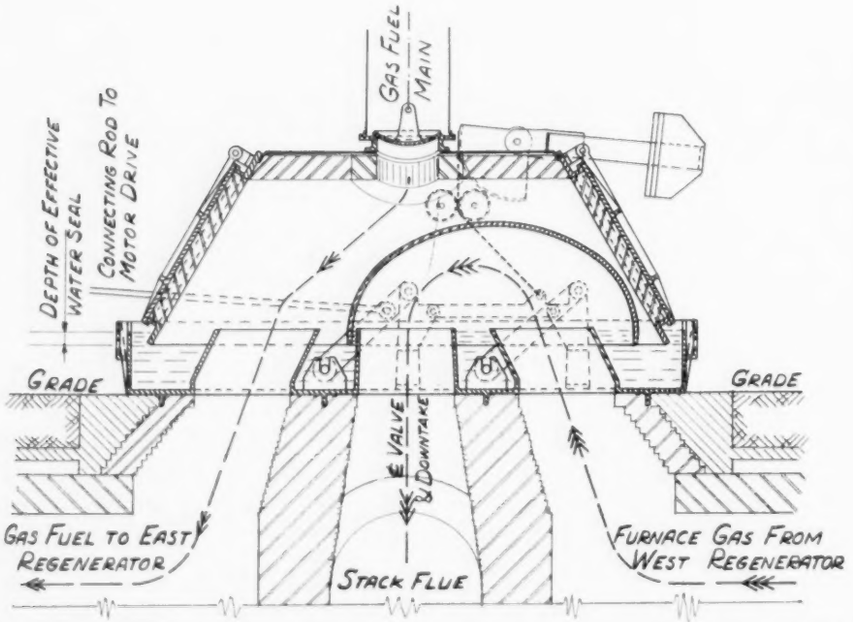
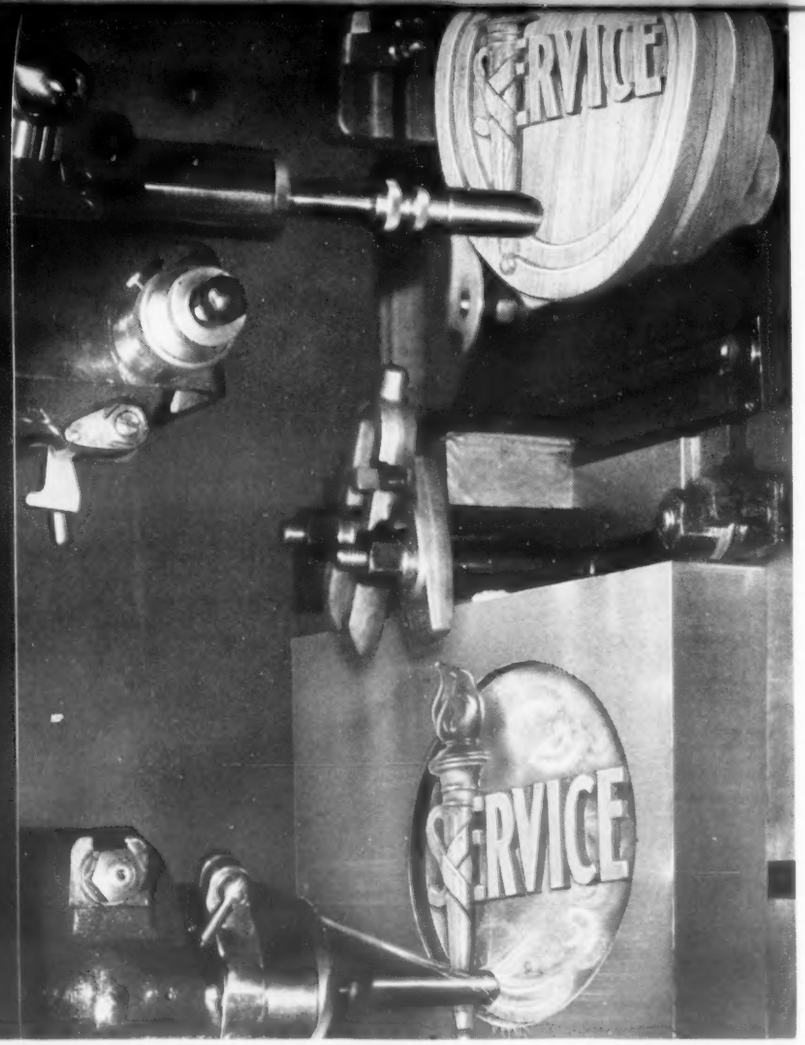


Fig. 196—Wellman valve as particularly adapted for use as the gas reversing valve in preheated mixed gas operation

Blasting Cartridge of Arc Welded High-Tensile Steel

A new blasting cartridge, which is enabled to resist high bursting pressures through use of high tensile steel and arc welding, is announced by the Safety Mining Co., Chicago.

These cartridge shells are welded with electrodes manufactured by the Lincoln Electric Co., Cleveland. The tensile strength of welds made in high tensile steel with this electrode runs as high as 105,000 pounds per square inch. This high strength enables the shells to resist a bursting pressure of 27,000 pounds per square inch, it is claimed.



A Keller automatic tool room machine manufactured by the Keller Division of Pratt & Whitney Co. This machine will automatically reproduce in steel or other hard metal a pattern of softer material.

Now, *reproduce this*—

THE plant manager and production agent of a company in Michigan manufacturing steering gears, gave permission to a Lubrication Engineer from the local Standard Oil office to run a test in their shop. For three months this engineer used *Acme Cutting Oil* on their automatics and was right on the job most of the time, carefully checking results. In that short period he showed an actual purchasing saving of over $350.00 *per month* and a definite saving in longer tool life.

Naturally, your case may present quite a different picture, but you *can* reproduce the essentials of the case we've outlined: Use the three tools outside of your shop, which are designed to help you and your machines: Standard Oil Service, Standard Oil Products and Standard Oil Monographs.

Standard Oil Service

Make use of Standard Oil Service as a *tool* to help keep up full-capacity performance *at lowest cost*. Let a Standard Oil engineer from your local Standard Oil office make sure that the tools in your shop are receiving proper treatment and giving maximum performance. It will imply no obligation whatever.

Standard Oil Products

Standard Oil products are another set of *tools* to help you.

ACME CUTTING OILS • PREMIER CUTTING OILS • SUPERLA SOLUBLE OIL • STANORUST Also ACME BASE OILS (Soluble Paste), STANOSTAMP, etc.

Standard Oil Monographs

These monographs or booklets have been prepared by the technical staff of Standard Oil Company (Ind.) and contain much valuable information and practical suggestions in your line of work. They too are constructive *tools* for your use. Frequently, large reductions in costs are made possible by practical discussions contained in these monographs.

Copr. 1935, Standard Oil Co.

Standard Oil Company (Indiana) (213)
910 S. Michigan Avenue, Chicago, Illinois
Gentlemen: Kindly send copies of the papers checked to the undersigned. It is understood that no obligation is implied.

- ☐ "Lubrication in Honing & Lapping Operations"
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(Attach list of any additional subjects in which you are specifically interested .....)

Name .....

Position ..... Company .....

Address .....

City ..... State .....

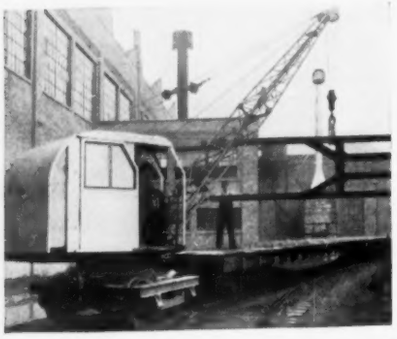
STANDARD OIL COMPANY (INDIANA)

CORRECT LUBRICATION

NEW EQUIPMENT

Rail Crane—

Harnischfeger Corp., Milwaukee, is announcing a new P & H bantam weight crane, self-propelling on standard rail wheels and designed for spur handling of materials and car switching. The unit, shown herewith, embodies all-welded construction. The 25-foot boom of welded tubular construction, provides a wide working radius and lifting capacities with 75 per cent stability ranging from 7730 pounds at 10 feet radius to 2360 pounds at 25 feet. This, together with a quickly attached clamshell bucket or magnet, makes it a practical unit for a wide variety of uses. Powered by a Ford V-8 motor, the rail crane employs a chain drive to each axle and exerts a drawbar pull from standstill of 3150 pounds.

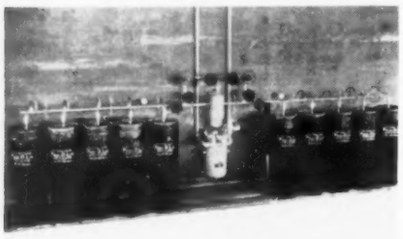


Harnischfeger bantam weight rail crane for spur handling

• • •

Acetylene Cylinder Manifold–

Linde Air Products Co., 30 East Forty-second street, New York, recently brought out a new wall type acetylene cylinder manifold. It is available in a 10-cylinder unit to which extensions in units of 5 or 10 cylinders can be made. The manifold, shown herewith, consists of two high-pressure header units. These feed into a central regulation system which delivers acetylene to the distribution piping system at pressures up to 15 pounds per square inch. Two high pressure header assemblies are connected by forged steel unions to a central system of six valves and two regulators for controlling operation of the manifold. Pressure in each header is indicated on Oxweld high-pressure acetylene gages.



Oxweld model M-8 wall type acetylene cylinder manifold

• • •

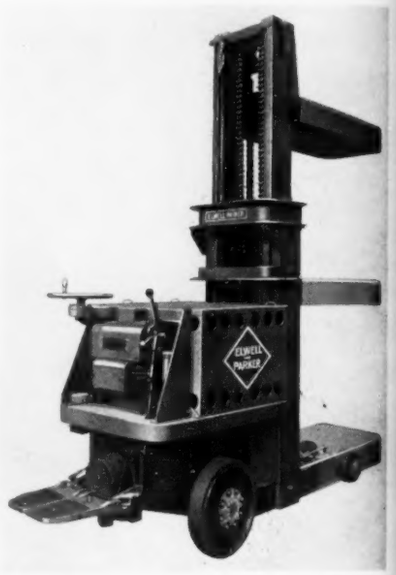
Hole Saw—

E. C. Atkins & Co., 402 South Illinois street, Indianapolis, is offering a new hole saw, shown herewith. Holes or plugs of any size from ⅞ up to 4⅛ inches in diameter may be cut with this device in flat metal sheets, pipe, bakelite, plywood, wood laminated veneer and other materials, using either a hand drill or drill press. The outstanding feature is the fact that the blade is instantly replaceable in a permanent saw holder, Spindles are available in two types, No. 2, ½ inch in diameter and No. 3, ¼ inch in diameter, both fitting any diameter of holders and blades. Holders or heads are made in two sizes, No. 4 for use with a ¼-inch center drill for hole guide; No. 5 for use with a drill jig. Alloy steel blades with 14 teeth to the inch are used.

Atkins hole saw has replaceable alloy steel blades

Elevator Truck—

Elwell-Parker Electric Co., Cleveland, recently introduced a type ELN-6 elevator truck, shown herewith. Capacity is 6000 pounds. Electric or gas-electric power is available. Chains are employed for hoisting and lowering loads. With telescoping uprights, the platform elevates 62½ inches before the inner uprights begin to rise. Automatic cutout switches are provided to stop the platform at both the upper and lower limits of travel. Moreover, the platform travel may be stopped manually at any height and held there by a spring-actuated electromechanical brake. Another feature is the interlocking control between travel controller, drive motor and foot pedals. Loads are assembled on skids and may be tiered in warehouse or box car as units, merely by elevating or lowering the platform.



Elwell-Parker elevator truck embodies safety control

• • •

Geared Head Engine Lathe—

Springfield Machine Tool Co., Springfield, O., recently brought out a new heavy-duty 20-inch geared head engine lathe designed to take heavy cuts with high speed steel and

Steels

for every need of the die maker

DIES impose many different combinations of exacting requirements on tool steels. Among the various grades of Bethlehem Die Steels one can be found that fits exactly into the set of conditions surrounding each class of service.

Bethlehem makes three grades of water-hardening die steel—X, XX and XCL. For work in which an oil-hardening steel is considered desirable Bethlehem Tool Room Oil-Hardening Tool Steel is recommended.

Whatever grade is selected the user is assured of a die steel manufactured at every step in accordance with the most up-to-date practice, representing generous value.

When it comes to blanking, stamping and similar dies for unusually long runs in service involving severe abrasion, Bethlehem Lehigh Die and Tool Steel is the material to use. This is a high-carbon, high-chromium die steel of the air-hardening type. The following figures will give some idea as to what may be expected of this steel: Pack-hardened at about 1850 deg. F. and drawn at 400 deg. F. a Rockwell-C hardness of 61 and Brinell of 600 are obtained.

For other requirements Bethlehem makes other tool steels equally outstanding in their fields. See the complete listing of Bethlehem Tool Steels on the next page.

AT EVERY STEP WE ASK:

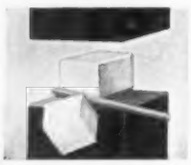
"Which Method will make the best TOOL STEEL?"

AT every stage in the manufacture of Bethlehem Tool Steels there's just one basis for determining the process to be followed. The answer to the question, "*Which method will make the best tool steel?*" solely decides the equipment and method that we use.

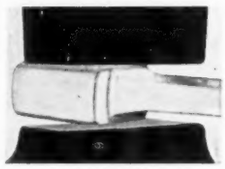
This policy has led to adoption of the following processes, which are outstanding features of practice in the Bethlehem Tool Steel Plant:

HIGH-FREQUENCY INDUCTION MELTING Bethlehem Tool Steels get the right start by melting in the high-frequency electric induction furnace, which makes steel to laboratory standards of accuracy.

LIBERAL INGOT DISCARD Large discards, from both the top and bottom of the ingot, mean that the buyer gets only the "cream" of the tool steel.



HAMMER-COGGING OF INGOTS It's far costlier to hammer-cog ingots than to roll them. But the tremendous impact developed under the 14,000-lb. hammer insures a complete working of the entire ingot and the breaking up of all undesirable ingot structure.



PROGRAM-CONTROLLED ANNEALING The exact heating, soaking and cooling curve desired is obtained by a motor-driven cylinder on which the edge of a plate guides the temperature regulator. Possibilities of human error are eliminated.

RIGOROUS INSPECTION Thoroughly representative cross-sections for inspection are obtained by cutting slabs from the tool-steel billet stock before rolling, and cutting discs from the finished bars. . . . These samples are subjected to hot-acid etch, hardenability tests and microscopic examination.

BETHLEHEM SPECIAL HIGH-SPEED TOOL STEEL
—for the usual high-speed steel applications.

BETHLEHEM EXTRA-SPECIAL HIGH-SPEED TOOL STEEL
—a tool steel for exceptionally severe service.

BETHLEHEM FINISHING TOOL STEEL
—a tungsten alloy water-hardening tool steel.

BETHLEHEM XXX SPECIAL TOOL STEEL
—a carbon finishing tool steel of the highest grade.

BETHLEHEM SUPERIOR TOOL STEEL
—a carbon-vanadium tool steel possessing the characteristics of straight-carbon tool steel combined with superior physical properties.

BETHLEHEM XX TOOL STEEL
—a general-purpose tool steel of extra-fine quality.

BETHLEHEM XCL TOOL STEEL
—for all purposes requiring a uniform and reliable yet comparatively inexpensive grade of tool steel.

BETHLEHEM X TOOL STEEL
—an inexpensive grade of carbon tool steel which many users have found very satisfactory for a wide variety of uses.

BETHLEHEM TOOL ROOM OIL-HARDENING TOOL STEEL
—for intricate dies and master tools which must hold dimensions through heat treatment.

BETHLEHEM No. 71 ALLOY STEEL
—for chisels, shear blades and heavily-stressed machinery parts.

BETHLEHEM TOUGH TOOL STEEL
—a chrome-vanadium steel possessing a high degree of hardness and toughness.

BETHLEHEM LEHIGH DIE AND TOOL STEEL
—a high-carbon, high-chromium steel especially suited for long-run dies.

BETHLEHEM OMEGA TOOL STEEL
—an exceptional impact-resisting steel.

BETHLEHEM No. 57 HOT-WORK TOOL STEEL
—a chrome-tungsten steel for hot-work tools.

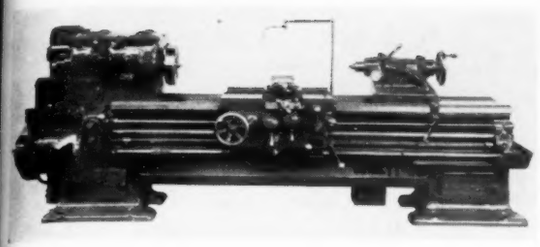
BETHLEHEM No. 445 HOT-WORK TOOL STEEL
—a chrome steel for hot-work tools.

Bethlehem District Offices: Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Kansas City, Milwaukee, New York, Philadelphia, Pittsburgh, San Antonio, St. Louis, St. Paul, Washington, Wilkes-Barre, York. *Pacific Coast Distributor:* Pacific Coast Steel Corp., San Francisco, Los Angeles, Seattle, Portland, Salt Lake City, Honolulu. *Export Distributor:* Bethlehem Steel Export Corp., New York.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

GENERAL OFFICES: BETHLEHEM, PA.



HEAVY-DUTY geared head engine lathe developed by Springfield Machine Tool Co. The 16-speed headstock is of massive design

high-speed cuts with carboloy. The reversing mechanism for the lead screw is mounted on the rear of the headstock and can be examined readily. A new heavy-duty gear box provides 36 changes of threads and feeds, including 11½. The apron has a front plate that can be removed to allow examination of all working parts. The carriage and compound rest of the unit, shown herewith, are long and broad with ample bearing surfaces to carry heavy pressures.

♦ ♦ ♦

Automatic Time Switches—

General Electric Co., Schenectady, N. Y., is introducing automatic time switches in types T-17 and 27, the former being shown herewith. Type T-17 will control almost any electric circuit on a schedule related to the time of day. It will perform any practical

Close-up exterior view of the General Electric type T-17 general-purpose automatic time switch

number of operations per day and can be set to skip one or more days if desired. Type T-27 is similar to T-17, except that it is not equipped with a weatherproof case or with an omitting device for selected days.

♦ ♦ ♦

Welding Torch—

Weldit Acetylene Co., Detroit, is bringing out a new welding torch. In using this automatic unit, shown herewith, the operator simply puts his natural thumb pressure on the control lever in the handle, lights and adjusts his flame for the work at hand in the conventional manner. When the torch is turned away from the job, release of thumb pressure on the control lever instantly reduces the welding flame to pilot light size, thus eliminating all unnecessary waste of gases. When the torch is again directed on the work, natural thumb pressure on control lever in the handle instantly produces full pre-adjusted welding flame. This

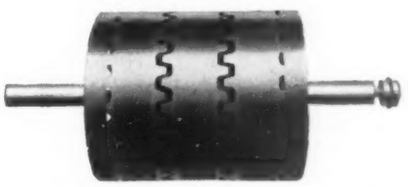
Automatic welding torch introduced by Weldit Acetylene Co.

same pressure and release on control lever may be repeated all day long without readjusting or relighting.

♦ ♦ ♦

High Intensity Magnetic Pulley—

Dings Magnetic Separator Co., Milwaukee, is introducing a new high intensity magnetic pulley embodying a structure that provides a maximum radiating surface. Air passing through radial and longitudinal openings insures a maximum dissipation of heat. Coil covers are of heavy bronze. The magnetic pulley shaft is turned and polished.



Design of Dings pulley provides high magnetic intensity

Each pulley, shown herewith, is supplied with set collars, bronze collector rings with double contact brushes for each collector ring, dustproof collector ring housing and approved steel switch cabinet in which is mounted a pilot lamp with bullseye indicator to show when current is flowing.

♦ ♦ ♦

Gasifier Unit—

Chicago Flexible Shaft Co., Industrial Furnace division, Chicago, is building a gasifier unit for all industrial gas-fired furnaces. No changes in the present functions of the furnace is necessary. The same burners are used. The principle of operation consists in feeding oil through the gasifier which changes it into gas. The unit is made in three sizes.

♦ ♦ ♦

Electric Tools—

Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, is announcing a new line of universal electric tools, three of which are shown in the accompanying illustration. These drills cover a range of sizes. The No. 815 is a short, light weight, powerful and compact unit designed especially for drilling in cramped quarters. Nos. 815 and 818 are particularly adapted for metal and heavy wood production drilling. No. 830 is a general purpose tool, while Nos. 846 and 848 are recommended for continuous work in pro-

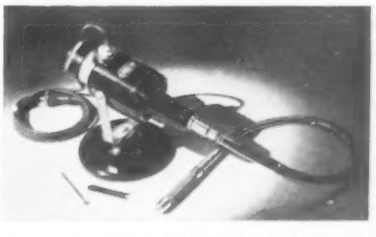
Three of the universal electric tools included in the new C P line

duction plants. Other models complete the line designed to meet a wide variety of service requirements.

♦ ♦ ♦

Flexible Shaft Tool—

Dumore Co., Racine, Wis., is announcing its new KG Vari-Speed flexible shaft tool, one of the major features of which is a governor control. With a twist of the wrist the operator can obtain a speed range of from 1700 up to 12,000 revolutions per minute. A ¼ horsepower motor drives burrs, rotary files, grinding wheels and cutters at the proper speed for work on metals, wood and composition materials. A rubber covered flexible shaft is available should the user desire it instead of the steel covered shaft shown in the accompanying illustration.



Dumore KG Vari-Speed flexible shaft tool

Open-Hearth Steel Melting Discussed

(*Concluded from Page 54*)

and C. H. Herty Jr., research engineer, Bethlehem Steel Co., Bethlehem, Pa. The rates of precipitation of ferrite from austenite at constant temperatures between A_3 and A_1 temperatures for different degrees of undercool were measured for five silicon-killed and four aluminum-killed steels ranging in carbon between 0.33 and 0.50 per cent.

These rates may be described by the equation for the rate of a first order chemical reaction, though this equation is not strictly applicable in this case. The effect of the method of deoxidation upon the rate of precipitation of ferrite is entirely one of controlling the grain size of the original austenite. When this grain size is large, the rate is small and when the grain size is small, the rate is large. On this basis, aluminum-killed steels, which possess a small austenite grain size react more rapidly than silicon-killed steels which possess a large grain size.

Undercool Is Factor

When, however, the rate of the reaction is expressed in terms of equal grain surface areas, the rates are much the same for both silicon and aluminum-killed steels. On this basis, the logarithm of the rate constant was found to be a linear function of the degree of undercool. The rate of precipitation of ferrite in silicon-killed steels showed a greater dependence upon degree of undercool than in aluminum-killed steels; the reason for this is not now clear. At low degrees of undercool the rate of ferrite formation is greater in aluminum killed steels than in silicon killed steels; while at greater degrees of undercool the reverse is the case. It seems certain that the rate is not determined by the rate of diffusion of carbon but by the rate of ferrite nucleation.

The ratio of the amount of ferrite formed on normalizing to the amount of ferrite formed on annealing was determined for these steels. The authors found that differences between silicon and aluminum-killed steels are entirely attributable to the effect of the austenite grain size; equal grain surface areas in the two types of steel gave the same ratios. Data were given for the limiting austenite grain sizes for the full development of ferrite on normalizing for cubes of different sizes.

Measurements on the depth of hardening on water quenching of 1-inch rounds of silicon and aluminum-killed steels were made. The effect of deoxidation on the austenite grain size was shown to be the chief factor in determining the hardenability. Hardenability was calculated on the basis of hardness areas and the results expressed as "percentage hardenability."

The third and concluding paper at this session, dealing with the equilibrium in the reaction of hydrogen with ferrous oxide in liquid iron at 2910 degrees Fahr., was contributed by M. G. Fontana, assistant metallurgist, E. I. du Pont de Nerours & Co., Wilmington, Del., and John Chipman, associate director of research laboratories, American Rolling Mill Co., Middletown, O.

This experimental study led the authors to several conclusions. The equilibrium constant is independent of the oxygen concentration, and the activity of ferrous oxide dissolved in liquid iron is therefore proportional to its per cent by weight. An unsuspected source of error in previous work was discovered and corrected, thereby changing the value of the constant from 4.75 to 3.95. The free energy of formation of ferrous oxide in a 1 per cent solution in liquid iron has been determined to be $-34{,}740$ calories at 2910 degrees Fahr.

The authors calculated the value of the carbon-iron oxide product at equilibrium in liquid iron to be 0.006, which is considered a confirmation of the experimental value, 0.010. The value of the constant of the water gas reaction found by combining the present data with Vacher's work is in agreement with that obtained from other sources.

Establishes Constants

Commenting on this paper in written discussion, H. C. Vacher, assistant scientist, national bureau of standards, Washington, said the authors had shown how careful and judicial experiments will lead ultimately to an explanation of numerical discrepancies. If this work had not been done, the accuracy of the equilibrium constants for the reactions of ferrous oxide with carbon monoxide or hydrogen would have been questionable and the choice of the best value would be a matter of opinion. As it is now, the equilibrium constants for both reactions are established firmly and in good agreement with reliable data for the water gas constant.

Of all the useful conclusions reached by Messrs. Fontana and Chipman, declared J. B. Austin, research laboratories, United States Steel Corp., Kearny, N. J., the most gratifying is that ferrous oxide forms an ideal solution in liquid iron, for it indicates that, just as in the case of gases, these metal systems approach ideality at high temperatures, a fact which greatly simplifies many calculations dealing with metallurgical reactions.

Ordinarily, continued Mr. Austin, the more refined the investigation of a system, the more evident becomes the deviation from ideal behavior, but in the present case the elimination of errors has revealed a closer approach to ideality, and the exceedingly careful work reported in this paper leaves no room to question the fact that the simple mass action law holds with considerable accuracy for the reaction between hydrogen and ferrous oxide.

Congratulating the authors on their efforts to hasten the time when steelmaking will be on a truly scientific basis, D. L. McBride, research engineer, Bethlehem Steel Co., Johnstown, Pa., said in his mind the importance of this work on the FeO-O-H system is not the accuracy of the results obtained but is the verification of the ideality of a solution of FeO in liquid iron. With this condition experimentally established, it is now possible to make calculations involving slag-metal reactions with a greater degree of reliability.

New Trade Publications

Burners — Surface Combustion Corp., Toledo, O. Bulletin No. SC-71, on its standard burners and burner equipment, illustrated.

Alloy Steels—Bethlehem Steel Co., Bethlehem, Pa. A 16-page booklet, No. 88, giving physical property chart for each of seven types or groups of alloy steels, with full descriptions.

Reamers—Pratt & Whitney Co., Hartford, Conn. Bulletin No. 411 on its Camlock serrated blade reamers, illustrated, with full description, details and data tables.

V-Belts—Manhattan Rubber Mfg. division of Raybestos-Manhattan Inc., Passaic, N. J. A bulletin, No. 6840, on V-belts, with diagrams, discussion of belt action and technical data for users.

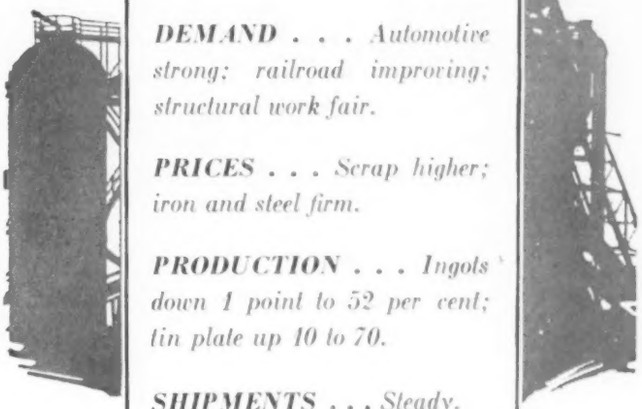
Metallurgical Equipment—Wilkens-Anderson Co., 111 North Canal street, Chicago. A booklet, Waco Service, No. 1, on new methods for the metallurgist, featuring its Bakelite press for mounting specimens, grinding equipment, polisher and metalscope.

Gear Generators—Farrel-Birmingham Co. Inc., Ansonia, Conn. A condensed treatise, in 54 pages, on gear manufacture, illustrated by 80 photographs and diagrams, for engineers and operating executives; also a catalog of Sykes gear generating machines.

Steelbacs—Charles H. Besley & Co., 118 North Clinton street, Chicago. A 16-page booklet on its Titan steelbacs, Bakelite resinoid bonded abrasive discs, with description of their characteristics; for use on disk grinders, Blanchard, Pratt & Whitney, Osterholm and similar machines.

Railroad, Auto Demands Heavier; Scrap Up

Steel Rate Off Point, Buying Held to Actual Needs; Price Advance Still Indefinite



MARKET IN TABLOID

DEMAND . . . *Automotive strong; railroad improving; structural work fair.*

PRICES . . . *Scrap higher; iron and steel firm.*

PRODUCTION . . . *Ingots down 1 point to 52 per cent; tin plate up 10 to 70.*

SHIPMENTS . . . *Steady.*

WITH railroads taking bids this week on 17,000 freight cars, continued strong demand for automotive steel, public works projects coming out faster, and another sharp advance in scrap prices, iron and steel markets give indications of moderately rising activity.

Producers have not yet decided the question of raising finished steel prices. While recent advances in raw materials and semifinished steel make it appear some further adjustments are inevitable, the tax on year-end inventories, amounting to as much as $2.40 a ton on some products, would cancel any saving affected by consumers through forward buying. Opinion in the industry now is that no further change will be made to take effect before Jan. 1.

Current steel demand, therefore, is held closely to actual consumer requirements, and the steelworks operating rate last week dropped 1 point to 52 per cent. Some rebound, however, is expected this week, as both Chicago and Youngstown are scheduled at higher rates.

Pennsylvania railroad will open bids Nov. 19 under the Clayton act on 50,000 to 60,000 tons of steel for freight cars to be built in its own shops. The following day it will open carbuilders' bids on other units; these bids to decide its distribution of 11,000 cars to its own and private shops. Missouri Pacific is in the market for 4000 freight cars; Missouri, Kansas, Texas, 1000; and Union Pacific, 1000.

The carriers' stocks of rails have been greatly reduced through restricted buying this year, and much heavier purchasing is expected to be an early development. Northern Pacific has awarded 15,000 tons of rails.

The government's public works program is now developing many inquiries for grade eliminations and school buildings, and there are prospects for moderately active demands for structural work through the winter. Structural shape awards for the week at 19,795 tons held close to recent averages.

Protests by steelmakers and labor against importations of German steel for public works in eastern states has led PWA to change its regulations, banning foreign purchases for federal-financed jobs, unless approved by the government after determining whether foreign government subsidies and exchange rate militate against American interests.

Only one shipyard bid last week on a liner, taking 15,000 tons of steel, for the International Mercantile-Roosevelt Steamship Co., and award may be delayed by a threat of an investigation by Secretary of Commerce Roper. At Pittsburgh 18,000 tons of steel is pending for barges. Eastern oil interests are planning construction of a large number of steel oil tankers.

Automobile manufacturers are releasing heavy tonnages of sheets and strip, with deliveries of full-finished sheets new deferred until the last week in December. Car production last week increased to 93,000, up 4000. Output is believed to be close to the peak for the fourth quarter, makers in the low-price field hoping to stabilize schedules near the present rate for the rest of the year. Assembly of at least 350,000 units is expected for November, and it appears the total for the year will be approximately 3,700,000, compared with 2,700,000 last year, and largest since 1929, with 5,358,420.

Miscellaneous steel requirements are fairly strong. Tin plate production has increased 10 points to 70 per cent. A leading canmaker is producing 750,000 beer cans daily, and will raise this schedule to 1,000,000 by Dec. 1.

Chicago district steelworks operations last week rose 1½ points to 57 per cent; Cleveland 8 to 77; New England 23 to 93. Youngstown dropped 10 to 53, and other districts were unchanged.

STEEL's iron and steel price composite holds at $33.16, and the finished steel index at $53.70. On 50-cent a ton advances in steelworks scrap at Chicago and Pittsburgh, the steelworks scrap composite is up 12 cents to $12.96.

COMPOSITE MARKET AVERAGES

	Nov. 16	Nov. 9	Nov. 2	One Month Ago Oct., 1935	Three Months Ago Aug., 1935	One Year Ago Nov., 1934	Five Years Ago Nov., 1930
Iron and Steel	$33.16	$33.16	$32.98	$32.84	$32.68	$32.15	$31.95
Finished Steel	53.70	53.70	53.70	53.70	54.02	54.00	49.62
Steelworks Scrap	12.96	12.83	12.67	12.72	12.05	9.82	11.17

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Nov. 16, 1935	Oct. 1935	Aug. 1935	Nov. 1934
Steel bars, Pittsburgh	1.85c	1.85c	1.80c	1.80c
Steel bars, Chicago	1.90	1.90	1.85	1.85
Steel bars, Philadelphia	2.16	2.16	2.11	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.40	2.40	2.55	2.60

Semifinished Material

Sheet bars, open-hearth, Youngs	$30.00	$28.00	$28.00	$28.00
Sheet bars, open-hearth, Pitts.	30.00	28.00	28.00	28.00
Billets, open-hearth, Pittsburgh	29.00	27.00	27.00	27.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

Pig Iron

	Nov. 16, 1935	Oct. 1935	Aug. 1935	Nov. 1934
Bessemer, del. Pittsburgh	20.81	$19.81	$19.81	$19.76
Basic, Valley	19.00	18.00	18.00	18.00
Basic, eastern, del. eastern Pa.	20.81	19.81	19.81	19.76
No. 2 foundry, del. Pittsburgh	20.31	19.31	19.31	19.26
No. 2 foundry, Chicago	19.50	18.75	18.50	18.50
Southern No. 2, Birmingham	14.50	14.50	14.50	14.50
No. 2X eastern, del. Philadelphia	21.68	20.68	20.68	20.63
Malleable, Valley	19.50	18.50	18.50	18.50
Malleable, Chicago	19.50	18.75	18.50	18.50
Lake Superior charcoal del. Chi.	25.25	24.90	24.25	24.04
Ferromanganese, del. Pittsburgh	90.13	90.13	90.13	89.79
Gray forge, del. Pittsburgh	19.67	18.67	18.67	18.63

Scrap

Heavy melting steel, Pittsburgh	$13.75	$13.65	$13.25	$11.15
Heavy melt. steel, No. 2, east. Pa.	11.00	11.00	10.50	8.35
Heavy melting steel, Chicago	13.25	12.50	12.35	9.10
Rails for rolling, Chicago	14.00	14.00	13.65	10.35
Railroad steel specialties, Chicago	13.75	13.50	13.55	10.05

Coke

Connellsville, furnace, ovens	$3.55	$3.55	$3.25	$3.60
Connellsville, foundry, ovens	4.35	4.35	4.00	4.60
Chicago, by-product foundry, del.	9.75	9.75	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.18c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.43c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold strip	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.08c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½c
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

(Base, 5 to 25 tons)

Pittsburgh	1.85c
Chicago or Gary	1.90c
Duluth	2.00c
Birmingham	2.00c
Cleveland	1.90c
Buffalo	1.95c
Detroit, delivered	2.00c
Pacific ports, f.o.b. cars, dock	2.40c
Philadelphia, del.	2.16c
Boston, delivered	2.27c
New York, del.	2.20c
Pitts., forg. qual.	2.10c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	2.06c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight carloads; less than straight carloads take trade quantity extras; 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.	
Standard wire nails	$2.40
Cement coated nails	2.40
Galvanized nails, 15 gage and coarser	4.40
do. finer than 15 gage	4.90

(Per pound)

Polished staples	3.10c
Galvanized fence staples	3.35c
Barbed wire, galv.	2.80c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$58.00

To Manufacturing Trade

Plain wire, 6-9 gage	2.30c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni. 1.05
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring ..... base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250 ..... carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅞-in.	
Pittsburgh	1.85c
Chicago or Gary	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop,	
Pittsburgh	1.95c
Chicago	2.05c
Cold-strip strip,	
Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
20-45 lbs.	$28.00
45-50 lbs.	$25.00
50-60 lbs.	$26.00
70-75 lbs.	$24.50
80-90 lbs.	$26.00
100 lbs.	$27.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll, qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $2; 16 and 20 lbs., up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	75 off
Rolled thread, ½ x 6, smaller	75 off

Machine Bolts

All sizes, cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts	75 off
Tire bolts	60 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	75 off
Step bolts	70 off
Elevator bolts	70 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	75 off
Do., ½ to 1-inch	75 off
Do., over 1-inch	70 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, expect on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

In.	Blk. Steel	Galv. Steel
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

	Steel	
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

	Steel
½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63
Iron	

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		Charcoal Iron	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots or 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are noted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935, card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east. fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$29.00
Philadelphia	34.67
Duluth	31.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.	35.00
Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	30.00

Slabs

Pitts., Chi., Cleve., Young.	29.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.80c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.55- 3.75
Connellsville, fdry.	4.35- 4.50
Connel., prem. fdry.	5.50- 5.75
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del.	11.50
St. Louis, del.	10.00
Birmingham, ovens	6.00
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
Detroit, ov., out. del.	9.00
Philadelphia, del.	9.03

Coke By-Products

Per gallon, producers' plants.

	Tank lots	Spot
*Pure and 90% benzol		18.00c
Toluol		30.00c
Solvent naphtha		30.00c
Commercial xylol		30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

*Naphthalene flakes and balls, in bbls., to jobbers	6.75c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$20.50	$21.00	$20.00	$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	20.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	.....	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass.	20.50	21.00	20.00	21.50
Hamilton, O.	19.50	19.50	19.00	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	.....	20.00	.....
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00
Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	26.26	21.26
Baltimore from Birmingham	21.08	.....	19.96	.....
Boston from Birmingham	20.62	.....	20.50	.....
Boston from Everett, Mass.	21.00	21.50	20.50	22.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	.....	.....
Brooklyn, N. Y., from Bmghm.	22.50	.....	.....	.....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	†19.72	.....	19.60	.....
Cincinnati from Hamilton, O.	20.58	20.58	20.08	.....
Cincinnati from Birmingham	20.20	.....	19.20	.....
Cleveland from Birmingham	19.62	.....	19.12	.....
Indianapolis from Hamilton, O.	21.93	21.93	21.43	22.43
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.07	21.07
Muskegon, Mich., from Chicago Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	.....	.....	.....
Newark, N. J., from Bethlehem	21.99	22.49	.....	.....
Philadelphia from Birmingham	20.93	.....	20.81	.....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25

Delivered from Basing Points:	No. 2 Fdry	Malleable	Basic	Bessemer
St. Louis, northern	20.00	20.00	19.50	.....
St. Louis from Birmingham	†19.62	.....	19.50	.....
St. Paul from Duluth	21.94	21.94	.....	22.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $24.00, Phila. base, standard and copper bearing, $25.13.

Gray Forge

Valley furnace	19.00
Pitts. dist. fur.	19.00

Charcoal

Lake Superior fur.	$22.00
Do., del. Chicago	25.25
Lyles, Tenn.	22.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $22.75; 6.51-7—$23.25; 7-7.50—$23.75; 7.51-8—$24.25; 8-8.50—$24.75; 8.51-9—$25.25; 9-9.50—$25.75. Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon: 2 to 3%, $1 per ton additional. Each unit over 3%, $1 per ton additional.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality

Pa., Ill., Md., Mo.	$45.00
Alabama, Ga., Ky.	$40.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$20.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$16.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsb'gh	90.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent. Spot, $5 a ton higher.	126-130.00
Silicoman., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead New York N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Nov. 9	9.25	9.37½	8.85	52.75	48.87½	4.50	4.35	4.85	*19.00	15.00	35.00
Nov. 11—Holiday.											
Nov. 12	9.25	9.37½	8.85	53.62½	49.37½	4.50	4.35	4.85	*19.00	15.00	35.00
Nov. 13	9.25	9.37½	8.85	53.00	49.00	4.50	4.35	4.85	*19.00	15.00	35.00
Nov. 14	9.25	9.37½	8.85	52.75	48.87½	4.50	4.35	4.85	*19.00	15.00	35.00
Nov. 15	9.25	9.37½	8.85	52.12½	48.70	4.50	4.35	4.85	*19.00	15.00	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.62½
Copper hot rolled	16.25
Lead cut to jobbers	8.25
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	16.62½
Seamless copper	16.75
Rods	
High yelow brass	13.12½
Copper, hot rolled	13.50
Anodes	
Copper untrimmed	14.00
Wire	
Yellow brass (high)	15.12½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	5.50- 5.75
Cleveland	5.87½-6.12½
Chicago	5.87½- 6.00
St. Louis	6.00- 6.25
Heavy Copper and Wire	
New York, No. 1	6.87½-7.12½
Chicago, No. 1	6.87½-7.12½
Cleveland	6.75- 7.00
St. Louis, No. 1	7.25- 7.37½
Composition Brass Borings	
New York	5.00- 5.25
Light Copper	
New York	5.75- 6.00
Chicago	5.37½-5.62½
Cleveland	5.75- 6.00
St. Louis	6.00- 6.25
Light Brass	
Chicago	3.25- 3.50
Cleveland	3.12½-3.37½
St. Louis	3.50- 3.75
Lead	
New York	3.50- 3.75
Cleveland	3.25- 3.50
Chicago	3.37½-3.62½
St. Louis	3.75- 3.85
Zinc	
New York	2.00- 2.25
Cleveland	2.50- 2.75
St. Louis	2.75- 3.00
Aluminum	
Borings, Cleveland	8.50- 9.00
Mixed, cast, Cleve.	13.25-13.50
Mixed, cast, St. L.	13.00-13.50
Clips, soft, Cleve.	14.75-15.00

SECONDARY METALS

Brass ingot, 85-5-5-5	9.25
Stand. No. 12 alum.	17.00-17.50

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.50
Boston, dock, expt.	9.50- 9.75
Boston, domestic	7.50- 7.75
Buffalo, No. 1	11.50-12.00
Buffalo, No. 2	10.00-10.50
Chicago, No. 1	13.00-13.50
Cleveland, No. 1	12.00-12.50
Cleveland, No. 2	11.00-11.50
Detroit, No. 1	9.50-10.00
Detroit, No. 2	7.50- 8.00
Eastern Pa., No. 1	12.00
Eastern Pa., No. 2	11.00
Federal, Ill.	9.25- 9.75
Granite City, R. R.	10.25-10.75
Granite City, No. 2	8.75- 9.25
N. Y., deal, No. 2	7.50- 7.75
N. Y., deal. barge	8.50- 8.75
Pitts., No. 1 (R. R.)	14.50-15.00
Pitts., No. 1 (dlr.)	13.50-14.00
Pittsburgh, No. 2	11.75-12.25
St. Louis	8.75- 9.25
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers	10.00-10.50
Chicago, factory	12.00-12.50
Chicago, dealer	11.00-11.50
Cleveland	11.50-12.00
Detroit	9.75-10.25
E. Pa., new mat.	11.50-12.00
Pittsburgh	13.50-14.00
St. Louis	6.25- 6.75
Valleys	12.75-13.00

BUNDLED SHEETS

Buffalo	8.00- 8.50
Cincinnati, del.	7.50- 8.00
Cleveland	9.50-10.00
Pittsburgh	12.25-12.75
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	8.00- 8.50
Cincinnati	7.00- 7.50
Detroit	5.00- 5.50
St. Louis	4.75- 5.25

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	14.50-15.00
Chicago (3 ft.)	14.50-15.00
Chicago (2 ft.)	15.50-16.00
Cincinnati, del.	13.50-14.00
Detroit	12.50-13.00
Pitts., open-hearth, 3 ft. and less	15.50-16.00
St. Louis, 2 ft. & less	13.25-13.75

STEEL RAILS, SCRAP

Boston	7.50- 7.75
Chicago	13.00-13.50
Pittsburgh	14.50-15.00
St. Louis	11.50-12.00
Buffalo	11.50-12.00

STOVE PLATE

Birmingham	7.00- 7.50
Boston, dealers	3.50- 3.75
Buffalo	10.25-10.75
Chicago	7.00- 7.50
Cincinnati, dealers	7.00- 7.50
Detroit, net	7.00- 7.50
Eastern Pa.	9.50
N. Y., deal. fdry.	6.00
St. Louis	8.00- 8.50

COUPLERS, SPRINGS

Buffalo	14.50-15.00
Chicago, springs	13.50-14.00
Eastern Pa.	14.50-15.00
Pittsburgh	15.75-16.25
St. Louis	12.00-12.50

ANGLE BARS—STEEL

Chicago	13.50-14.00
St. Louis	12.00-12.50

RAILROAD SPECIALTIES

Chicago	13.50-14.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	14.50-15.00
Cleveland, billet, bloom crops	15.00-15.50
Eastern Pa., crops	15.50-16.00
Pittsburgh, billet, bloom crops	16.00-16.50
Pittsburgh, sheet bar crops	14.75-15.25

FROGS, SWITCHES

Chicago	13.00-13.50
St. Louis, cut	11.50-12.00

SHOVELING STEEL

Chicago	13.00-13.50
Federal, Ill.	9.25- 9.50
Granite City, Ill.	8.75- 9.25

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	11.50-12.00
Chicago, No. 1, net	10.00-10.50
Chicago, No. 2	13.00-13.50
Cincinnati, No. 2	9.50-10.00
Eastern Pa.	12.00-12.50
N. Y., No. 1, deal.	9.50-10.00
St. Louis, No. 1	6.75- 7.20
St. Louis, No. 2	10.25-10.75

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	10.00-11.00
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	10.00-10.50
Chicago, No. 1	11.50-12.00
Cinci., No. 1, deal.	7.50- 8.00
Cincinnati, No. 2	4.00- 4.50
Cleveland, No. 2	8.00- 8.50
Detroit, No. 1, new	8.50- 9.00
Valleys, new, No. 1	12.50-12.75

MACHINE TURNINGS

Birmingham	4.00- 4.50
Boston, dealers	3.25- 3.50
Buffalo	5.75- 6.25
Chicago	6.50- 7.00
Cincinnati, dealers	5.50- 6.00
Cleveland	7.50- 8.00
Detroit	5.00- 5.50
Eastern Pa.	7.50- 8.00
New York, dealers	3.50- 3.75
Pittsburgh	9.50-10.00
St. Louis	2.25- 2.75
Valleys	9.00- 9.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	7.75- 8.25
Cincinnati, dealers	5.00- 5.50
Cleveland	7.50- 8.00
Detroit	5.25- 5.75
Eastern Pa.	6.00- 6.50
New York, dealers	1.50- 1.75
Pittsburgh	8.25- 9.25

CAST IRON BORINGS

Birmingham, plain	4.00- 4.50
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	7.75- 8.25
Chicago	6.00- 6.50
Cincinnati, dealers	5.00- 5.50
Cleveland	7.50- 8.00
Detroit	5.25- 5.75
E. Pa., chemical	10.00-12.00
New York, dealers	1.50- 1.75
St. Louis	3.25- 3.75

PIPE AND FLUES

Cincinnati, dealers	6.50- 7.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	7.50- 8.00
Cincinnati	5.50- 6.00
Eastern Pa.	9.00- 9.50
New York, dealers	5.00- 5.25
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	5.75- 6.00
Buffalo	10.50-11.00
Cleveland	10.00-10.50
Detroit	8.00- 8.50
Pittsburgh	12.25-12.75

FORGE SCRAP

Boston, dealers	4.50- 5.00
Chicago, heavy	14.00-14.50
Eastern Pa.	11.50-12.00

ARCH BARS, TRANSOMS

St. Louis	12.00-12.50

AXLE TURNINGS

Boston, dealers	3.75- 4.25
Buffalo	10.50-11.00
Chicago, elec. fur.	12.00-12.50
Eastern Pa.	11.00
St. Louis	7.75- 8.25

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.50-11.00
Buffalo	14.50-15.00
Chicago, net	14.50-15.00
Eastern Pa.	17.00
St. Louis	12.50-13.00

SHAFTING

Boston, ship point.	13.00-13.25
Eastern Pa.	18.50
New York, dealers	13.50-14.00
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	9.00- 9.50
Boston, iron deal.	6.00- 6.25
Buffalo, iron	11.00-11.50
Buffalo, steel	14.50-15.00
Chicago, iron	12.50-13.00
Chicago, rolled steel	13.50-14.00
Cincinnati, iron	10.00-10.50
Eastern Pa., iron	12.50-13.00
Eastern Pa., steel	14.50-15.00
Pittsburgh, iron	14.00-14.50
Pittsburgh, steel	15.50-16.00
St. Louis, iron	10.00-10.50
St. Louis, steel	12.00-12.50

NO. 1 CAST SCRAP

Birmingham	9.00- 9.50
Boston, No. 1 mach.	9.00- 9.25
Boston, No. 2	8.00- 8.25
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	12.25-12.75
Buffalo, mach.	13.00-13.50
Chicago, agri. net	10.00-10.50
Chicago, auto	11.00-11.50
Chicago, mach. net	12.00-12.50
Chicago, railr'd net	10.50-11.00
Cinci., mach. cup	10.00-10.50
Cleveland, cupola	12.25-12.75
Detroit, net	10.00-10.50
Eastern Pa., cupola	12.50-13.00
E. Pa., mixed yard	10.50
Pittsburgh, cupola	13.75-14.25
San Francisco, del.	13.50-14.00
Seattle	7.50- 9.00
St. Louis, No. 1	9.50-10.00
St. L., No. 1 mach.	11.75-12.25

HEAVY CAST

Boston, del.	6.00- 6.25
Buffalo, break.	10.50-11.00
Cleveland, break	10.00
Detroit, No. 1, mach. net	12.00-12.50
Detroit, break.	8.50- 9.00
Detroit, auto net	11.50-12.00
Eastern Pa.	11.50-12.00
N. Y., break. deal.	7.25- 7.75
Pittsburgh	12.75-13.25

MALLEABLE

Birmingham, R. R.	11.50-12.50
Boston, consum.	13.50-14.50
Buffalo	14.50-15.00
Chicago, R. R.	15.50-16.00
Cincinnati, agri. del.	11.00-11.50
Cleveland, rail	15.50-16.00
Detroit, auto net	12.50-13.00
St. Louis, R. R.	13.00-13.50
Eastern Pa., R. R.	14.00-14.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.50-11.00
Boston, dealers	8.00- 8.50
Buffalo	12.00-12.50
Chicago	13.75-14.25
Eastern Pa.	13.00-14.00
New York, dealer	10.50-11.00
St. Louis	12.25-12.75

LOCOMOTIVE TIRES

Chicago (cut)	13.50-14.00
St. Louis, No. 1	11.75-12.25

LOW PHOS. PUNCHINGS

Buffalo	14.50-15.00
Chicago	14.50-15.00
Eastern Pa.	15.00-16.00
Pittsburgh (heavy)	15.00-15.50
Pittsburgh (light)	14.00-14.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.50
No. Afr. low phos.	10.50
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	10.50
Tungsten, spot sh. ton unit, duty pd.	$15.50-16.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.25

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	3.00c
Boston††	3.00c
Buffalo	3.00c
Chattanooga	3.31c
Chicago (j)	3.00c
Cincinnati	3.22c
Cleveland	3.00c
Detroit	3.09c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.35c
New York‡(d)	3.31c
Pitts. (h)	2.95c-3.10c
Philadelphia*	3.03c
Portland	3.70c
San Francisco	3.50c
Seattle	3.70c
St. Louis	3.25c
St. Paul	3.25c-3.40c
Tulsa	3.25c

IRON BARS

Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.22c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.20c
Tulsa	3.25c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York (d)	3.46c
Philadelphia*	2.98c
Pittsburgh(h)	3.15c
Portland (i)	3.70c
San Francisco	3.50c
Seattle (i)	3.70c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

PLATES

Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York (d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.50c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.31c
Portland	3.75c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Francisco	3.60c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.30c
Tulsa	3.70c

NO. 24 BLACK

Baltimore*†	3.60c
Boston (g)	2.95c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.02c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New Orleans	4.50c
New York	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.25c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.90c
Tulsa	4.75c

NO. 24 GALV. SHEETS

Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.40c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.50c
Tulsa	5.10c

BANDS

Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York (d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.45c

HOOPS

Baltimore	2.30c
Boston	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.56c
Philadelphia	3.43c
Pittsburgh (h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.55c

COLD FIN. STEEL

Baltimore (c)	3.58c
Boston	3.75c
Buffalo (h)	3.40c
Chattanooga*	3.98c
Chicago (h)	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.49c
Los Ang. (f) (d)	5.85c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.81c
Philadelphia	3.61c
Pittsburgh	3.20c
Portland (f) (d)	6.00c
San Fran. (f) (d)	5.80c
Seattle (f) (d)	6.00c
St. Louis	3.60c
St. Paul	3.87c
Tulsa	4.50c

COLD ROLLED STRIP

Boston, 0.100-in., 500 lb. lots	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	3.20c
Detroit	3.33c
New York	3.36c
St. Louis	3.45c

TOOLS STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70-10
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 inches; (j) shapes other than rounds, flats, fillet angles, 3.15c.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 14

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

PIG IRON	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Silicon	$15.38 3 2 6	$14.17	1 15 0
Basic bessemer	15.38 3 2 6*	12.95	1 12 0
Hematite, Phos. .03-.05	15.99 3 5 0	.....	.....
SEMIFINISHED STEEL			
Billets	$27.06 5 10 0	$19.02	2 7 0
Wire rods, No .5 gage	41.82 8 10 0	36.44	4 10 0
FINISHED STEEL			
Standard rails	$40.59 8 5 0	$44.53	5 10 0
Merchant bars	1.65c 7 10 0	1.15c to 1.20c	3 2 6 to 3 5 0
Structural shapes	1.62c 7 7 6	1.14c	3 1 6
Plates, †¼ in. or 5 mm.	1.76c 8 0 0	1.56c	4 5 0
Sheets, black, 24 gage or 0.5 mm	2.09c 9 10 0	2.13c	5 16 0††
Sheets, gal., 24 gage, corr.	2.53c 11 10 0	2.28c	6 5 0
Bands and strips	1.87c 8 10 0	1.46c	4 0 0
Plain wire, base	2.04c 9 5 0	1.96c	5 7 6
Galvanized wire, base	2.36c 10 15 0	2.29c to 2.33c	6 5 6 to 6 7 6
Wire nails, base	2.64c 12 0 0	2.11c	5 15 0
Tin plate, box 108 lbs.	$4.61 0 18 9	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.61 3 7 6(a)	$17.13	260	$12.50	370	$25.36 63
Basic bessemer pig iron	17.22 3 10 0(a)	12.52	190	11.83	350	27.98 (b) 69.50
Furnace coke	4.18 0 17 0	6.26	95	3.89	115	7.65 19
Billets	27.06 5 10 0	28.34	430	18.25	540	38.85 96.50
Standard rails	1.82c 8 5 0	2.08c	694	1.65c	1,100	2.42c 132
Merchant bars	1.89c 8 12 0	1.68c	560	.90c	600	2.01c 110
Structural shapes	1.93c 8 15 0	1.65c	550	.90c	600	1.97c 107.50
Plates, †¼-in. or 5 mm.	1.99c 9 1 3	2.10c	700	1.05c	700	2.32c 127
Sheets, black	2.48c 11 5 0§	1.80c	600‡	1.24c	825‡	2.64c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.92c 13 5 0	3.23c	1,075	2.25c	1,500	6.77c 370
Plain wire	2.04c 9 5 0	3.15c	1,050	1.73c	1,150	3.17c 173
Bands and strips	2.06c 9 7 0	1.95c	650	1.26c	840	2.32c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 66.25 per cent over paper sterling.

Bars

Bar Prices, Page 72

Pittsburgh—In view of the $1 a ton price increase in bars made early in September, no bar price increase may be made for first quarter, despite the fact that rerolling billets have been advanced and both plates and structural shapes will be advanced.

This policy has not been settled definitely, however, and there is divided opinion in the trade as to whether a moderate hot-rolled bar price advance of $1 a ton might be accepted as a compromise. The market holds fairly steady at 1.85c, base, Pittsburgh, on 5 to 25-ton lots of merchant bars.

Cleveland—No tangible evidence of an approaching price advance in steel bars has appeared in the market here, although since pig iron, coke and semifinished steel prices were raised an increase in finished steel is considered inevitable. It is understood some of the leading producers were opposed to an advance on finished steel for this or first quarter, pointing out that the rise in semifinished was to bring this more in line with existing finished steel prices. More recently, however, opinion has been modified, and some adjustments on finished steel for first quarter are anticipated. Consumers have not made speculative purchases. The tax on inventories at the close of the year is $2 a ton or more, which buyers say would wipe out their saving in the event prices are raised. Actual consumer demand is well sustained, especially that of automobile and agricultural implement manufacturers.

Chicago—Improvement in steel bar sales and specifications awaits the resumption of automotive buying, which recently has been held in abeyance pending the determination of schedules as dictated by results of the motor car show. Bar demand elsewhere is fairly steady with farm implement manufacturers holding schedules at an active rate.

Boston—On 168 tons of nickel steel bars for the Boston navy yard all eight bidders quoted 4.355c last week. Buying of commercial steel bars has been stimulated little by rumors of higher prices for next quarter. Specifications against contracts are steady. Shipments are held to the recent current rate, notably in alloy and forging material.

New York—Bar tonnage is fair, although consumers see little ahead beyond immediate contracts for their products. Possibility of an advance may stimulate specifications later. Meanwhile, the merchant market is 1.85c, Pittsburgh or 2.20c, New York.

Philadelphia — Consumption of commercial bars is holding at a good rate and with the possibility of an advance in prices the first of next year some protective buying is likely to develop. In some quarters an increase of $1 a ton is expected. The present price is 1.85c, Pittsburgh, or 2.16c, Philadelphia.

Plates

Plate Prices, Page 72

Pittsburgh—Prospects for 18,000 to 20,000 tons of steel plates and shapes developing into orders are inherent in active inquiries before river barge builders. Barge shops estimate that 75 to 90 steel barges in lots of one to 12 are promising. Steel plates, which remain based on 1.80c, Pittsburgh, are in for a likely advance in view of the $2 a ton increase in blooms and slabs, but the effective date of the plate advance probably will be the first quarter of 1936. Nashville Bridge Co., Nashville, Tenn., bidding $17,600, Nov. 13, was the only estimator on a 45 x 11 x 5 2/3-foot steel pusher boat hull for federal engineers at Pittsburgh.

Cleveland—While prospects for an advance in prices has not yet driven in much tonnage, fabricators have been quick to obtain protection on many pending jobs requiring plates and shapes. Producers are guaranteeing current prices for 60 days on identified projects. One fabricator thus protected more than 100 which he is figuring. While it is believed a price advance would result in the closing of many contracts, actual orders for the present are relatively small, generally limited to less than carload lots. Aggregate tonnage is not as heavy as in October.

Chicago—With more than 6000 freight cars pending for western roads in addition to fairly substantial repair programs planned by several interests, prospects for heavier plate demand are more favorable. Buying recently has been principally for miscellaneous uses with most activity noted in the lighter gages. Both industrial and municipal tank work continue relatively quiet.

Boston—Inquiry for plates is heavier, notably for standpipes and tanks for water storage, standpipes being up for Northboro, Millis, Sturbridge, Sudbury, Athol and Northbridge, all in Massachusetts, bids being in on several. While there has been no open break in plate prices at 2.22c, Boston, some concessions are reported through the waiving of extras and services.

Philadelphia—Probability of an advance in plates by the end of the year is expected to stimulate specifications over the next few weeks. Meanwhile, most activity has been confined to protective contracting but with no improvement date in specifications. Much interest is being centered on the Clayton act opening of the Pennsylvania railroad Nov. 19, involving a large tonnage for car work to be conducted in its own shops.

New York—While there is considerable divergence of opinion as to whether prices will be advanced on steel plates buyers are practically all protected by contracts and are little disposed to specify beyond immediate needs. Fast deliveries are the rule and one eastern mill is rolling plates within 24 hours of the order. With Newport News Shipbuilding & Dry Dock Co., Newport News, Va., placing the only definite bid on the International Mercantile Marine-Roosevelt Co. liner, involving 15,000 tons of hull steel, it is reported Secretary of Commerce Roper will order an investigation, probably causing much delay. Shipbuilders say sufficient time was not given for figuring so large a job. A substantial tonnage is pending for tanks for the Barber Asphalt Co., Maurer, N. J.

San Francisco — Demand for plates remains quiet, less than 3000 tons being up for figures. To date this year only 42,125 tons have been booked as compared with 51,584 tons for the corresponding period in 1934. The largest award was secured by Western Pipe & Steel Co. and involved 175 tons of 14-inch 12 gage welded steel pipe for Los Angeles. Bids open on Nov. 19 for two water conduit projects for the Vista Irrigation District, Vista, Calif., calling for 911 tons of 8 to 26-inch welded steel pipe ranging from 3/16 to ¼-inch plate. Alternate bids will be taken on portions of the lines for cast iron or concrete pipe.

Seattle — Demand for light plates continues active for general repair, tanks and service station jobs but no large projects are up for figures in this area. Army engineers are reported in the market for 1300 tons for a proposed land pipe line at Fort Peck, Mont. Repairs to the steamer FREDERIKA LENSEN, contracts to the Burrard Dry Dock Co. Ltd., North Vancouver, B. C., require 100 tons or more of new plates.

Contracts Placed

850 tons, 28-inch land pipe, United States engineer, Kansas City, Mo., to Treadwell Construction Co., Midland, Pa.

830 tons, ten 100 x 26 x 6½-foot welded steel barges for Massman Construction Co., Kansas City, Mo., to St. Louis Shipbuilding Co., St. Louis.

540 tons, tank, Loup river municipal power plant, North Platte, Neb., to

Chicago Bridge & Iron Works, Chicago.

410 tons, 1,000,000-gallon tank, city of Salina, Kans., to Chicago Bridge & Iron Works, Chicago.

220 tons, tank barge 175x 27 x 10 feet, for Aetna Oil Co., Louisville, Ky., to McClintic-Marshall Corp., Bethlehem, Pa.

175 tons, 14-inch 12 gage welded steel pipe, specification 1824, Los Angeles, to Western Pipe & Steel Co., San Francisco.

100 tons, elevated steel water tank, Toccoa, Ga., to R. D. Cole Mfg. Co., Newnan, Ga.

100 tons, 200,000-gallon elevated steel tank, Emporia, Va., to Pittsburgh-Des Moines Steel Co., Pittsburgh, $12,170, bids Oct. 30.

100 tons, ship repairs, to Burrard Dry Dock Co. Ltd., North Vancouver, B. C.

Contracts Pending

1300 tons, land pipe line for Fort Peck, Mont., project; bids asked.

536 tons, 8 to 26-inch welded steel, cast iron or concrete pipe, Vista irrigation district, Vista, Calif., PWA Project 1159; bids Nov. 19.

375 tons, 8 to 18-inch welded steel or cast iron pipe, Vista irrigation district, Vista, Calif., PWA Project 1319; bids Nov. 19.

210 tons, 500,000-gallon elevated tank, Decatur, Ga. bids Nov. 22, to W. H. Weaver, city engineer.

100 tons, 200,000-gallon elevated steel tank, Carlisle barracks, Pa., bids withdrawn, Nov. 9.

100 tons or more, standpipe and tank, Concord, N. H.

Transportation

Track Material Prices, Page 73

Bids will be taken by the Pennsylvania Nov. 19 on 50,000 to 60,000 tons of plates, shapes, bars, sheets, wheels and axles, under the Clayton act. This material will cover at least part of the requirements for cars the Pennsylvania proposes to build in its own shops against the recently announced program of 10,000 new cars and heavy repairs to 1000 existing cars. It is not yet known how many cars will be awarded to outside bids submitted by carbuilders Nov. 20. The opening Nov. 19 involves by all odds the largest tonnage of railroad steel in this district in many months. The Pennsylvania will also open bids on steel pipe the same day. New cars involved in the Pennsylvania program include 7700 all-steel box cars, 2000 seventy-ton gondolas and 300 cement cars.

Northern Pacific in placing 15,000 tons of rails with Bethlehem Steel Co., Carnegie-Illinois Steel Corp., and Colorado Fuel & Iron Co. describes it as its largest order in seven years. Bethlehem Steel Co., Bethlehem, Pa., and United States Steel Products Co., New York, have divided equally an order for 1720 tons of 90-pound rails for the Panama canal commission. Norfolk & Western will open bids Nov. 20 on wrought steel wheels.

An early improvement in freight car buying is indicated by plans of several roads to build several thousand units. These include 1000 cars for the Missouri-Kansas-Texas, 4000 for the Missouri Pacific of which 500 all-steel box cars are on definite inquiry and rebuilding of 600 by the St. Louis-San Francisco.

South African railways have awarded 450 dropside steel bogies and 500 four-wheel freight wagons to Metropolitan-Cammell Carriage & Wagon Co., England, 400 four-wheel freight wagons to the Oheinsteil-Koppel Co., Germany, and 500 bogies to a Belgian concern.

Car Orders Placed

Chicago, Rock Island & Pacific, conversion of 170 box cars to single-deck stock cars, to Ryan Car Co., Chicago.

Rail Orders Placed

Northern Pacific, 15,000 tons to Bethlehem Steel Co., Bethlehem, Pa., Carnegie-Illinois Steel Corp., Pittsburgh, and Colorado Fuel & Iron Co., Denver.

Panama Canal, 1720 tons, 90-pound rails divided equally, Bethlehem Steel Export Corp., Bethlehem, Pa., and United States Steel Products Co., New York.

Car Orders Pending

Missouri Pacific, 500 all-steel box cars, part of program for 4000 cars.

Missouri-Kansas-Texas, 500 stock cars, 300 forty-ton gondolas and 200 fifty-ton gondolas.

St. Louis-San Francisco, 600 box cars to be rebuilt with steel sides and roofs and parts for 500 hopper cars to be replaced.

Wabash, repairs to 180 box cars; court authorization issued.

Chicago, Milwaukee, St. Paul & Pacific, three 4-4-2 Atlantic type.

Buses Booked

J. G. Brill Co., Philadelphia, eleven 30-passenger trackless trolleys for Shreveport Railways Co., Shreveport, La.

Sheets

Sheet Prices, Page 72

Pittsburgh—A few of the small sheet mills cannot promise delivery earlier than Christmas week on full-finished grades, and some of the larger producers were booked up for five to six weeks on cold-rolled grades. This has been caused by unusually heavy automobile buying. That some price increase will be made in sheets appears inevitable, but no announcements have been made. Operations in the industry were off slightly last week, sheet mills running at about 65-70 per cent.

Cleveland—Mill backlogs are increasing as the result of further heavy buying by automobile manufacturers and partsmakers, production here and in an adjacent lake district continuing at capacity. Some sellers state that if the present rate of specifications for full-finished sheets holds for another week they will be practically out of the market for delivery during the remainder of this quarter. Stovemakers' requirements are sustained at recent volume, and refrigerator manufacturers are getting under way with new models.

Chicago—Sheet specifications are steady but consumers continue to seek protection on future requirements in view of the likelihood of higher prices on first quarter business. Automotive demand is increasing and heavy shipments are in prospect for at least the next 60 days.

Boston—Blue annealed demand for 275-gallon tanks for oil burner units has tapered substantially. The season has been active, one shop making more than 9000 units. Sheet requirements for truck-body tanks are sizable, and industrial demand, including stamping needs, are well sustained.

New York—Pending clarification as to the outlook for higher prices, sheet consumers in this district are moving cautiously. Leading sellers here claim there has been no real disposition among consumers as yet to anticipate needs. Meanwhile, 1600 tons of No. 24 gage pickled, blue finished sheets are pending for license tags for the state of New York, bids Nov. 18. The inquiry calls for delivery up to May 31, although leading sellers indicate that they will not bid for delivery beyond the end of this quarter.

Philadelphia—Prospects of a possible advance in sheets, combined with the fact that deliveries are already well extended on most grades, have resulted in some protective buying of material for shipment before the end of the year. Attention is being focused by producers on requirements for the Pennsylvania car program. Bids will be opened under the Clayton act Nov. 19 on 50,000 to 60,000 tons of steel, of which a substantial portion will be sheets, for equipment likely to be built in the company's own shops, leaving substantial tonnage yet to be figured for equipment which may be built in outside shops. Incidentally, carbuilders will submit figures to the Pennsylvania on equipment a day later, Nov. 20. Radio and stove tonnage is beginning to undergo seasonal decline.

Buffalo—Sheet demand sustains district mill operations at about 90 per cent. Output at this rate is expected for 30 days or more.

Cincinnati—Backlogs of district sheet mills continue to increase with

rolling schedules near 100 per cent. Diversified demand, especially for household equipment, is heavy.

St. Louis—Sheet demand continues active, from a wide variety of users. Some stimulation to the market has been imparted by the recent advance of $2 per ton in sheet bars. Rural roofing repair work and heavy requirements from manufacturers of utensils and other commodities are reflected in steady buying of galvanized sheets.

Birmingham, Ala.—Mills producing sheets continue steady operation, though not at capacity. Inquiries are active.

Pipe

Pipe Prices, Page 73

Pittsburgh—Pipe producers may wait until Dec. 1 or thereafter to announce prices for first quarter. A fair accumulation of orders for pipe, mainly oil country goods and mechanical tubing, is supporting the rate of operations in this district's mills at about 50 per cent.

Cleveland—Three federal housing projects in Cleveland, on which contracts for reinforcing bars and other materials have been awarded, will require several hundred tons of steel pipe and conduit. Municipal demand for both cast and steel pipe is light. Vermillion, O., is taking bids on a small tonnage of steel pipe for a water intake.

Chicago—Cast pipe orders are more numerous, with inquiries also more active. This improvement is confined principally to work backed by federal funds. Business generally is in small individual lots, but the volume of pending work indicates November and December sales will be substantially heavier than most of the preceding months of this year.

Boston—Cast pipe inquiry and buying has improved sharply, West Newbury and Sudbury, Mass., having the largest inquiries out for bids. Purchases during the last 10 days have been approximately 2000 tons, including small lots. As yet WPA buying has been light in New England.

New York—Cast pipe inquiry is heavier, bids closing on more than 2500 tons during the next 10 days. Buying, however, is confined to small lots, such purchasing being more active. Prices are firm with foundries considering the announcement of an advance.

Philadelphia—Approximately 5000 feet of 18-inch steel pipe is up for bids Nov. 18 for improvements along the Delaware and Chesapeake canal. In addition, this work, which involves the construction of three bridges, will

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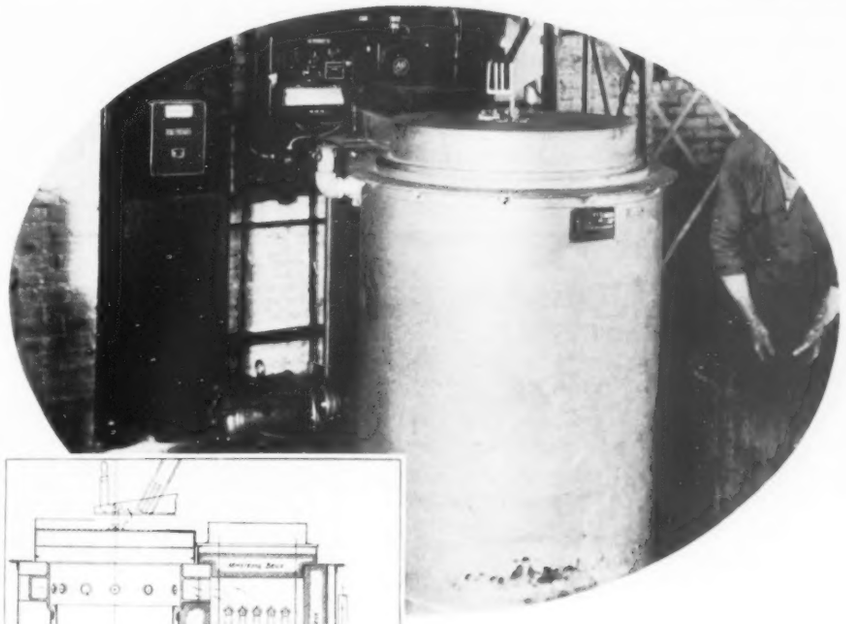
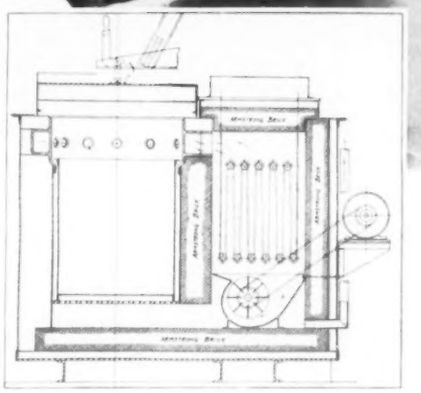




Lindberg Cyclone Tempering Furnace in the plant of the Russell-Burdsall and Ward Bolt and Nut Company, Rockford, Ill. This Armstrong insulated furnace increased production 50% over the former tempering methods and at a lower cost per pound.

THE new Cyclone Furnace, built by the Lindberg Engineering Co., of Chicago, is setting performance records for air tempering furnaces with its faster heating, rapid quality production. Large quantities of air are forced to every part of the densest charge by a blower type fan. The furnace's rugged construction eliminates production interruptions.

Armstrong's EF-22 Insulating Fire Brick and Armstrong's A-25 Insulating Brick help to make these achievements possible. These brick make possible thinner walls with consequent quicker heating, a sharper furnace and more accurate temperature control. Additional important advantages offered by these brick are lower fuel costs, more efficient production, and more uniform quality.

Armstrong's EF-22 and EF-26 Brick are light-weight insulating fire brick for use up to 2200° F. and 2600° F. respectively. N-16 and N-20 Insulating Brick are recommended for temperatures up to 1600° F. and 2000° F. respectively behind the refractory. Armstrong's A-25 Insulating Brick will withstand temperatures up to 2500° F. For complete information on all of Armstrong's high temperature products, write Armstrong Cork Products Co., Building Materials Division, 985 Concord Street, Lancaster, Pa.

Armstrong's

HIGH TEMPERATURE INSULATION

require 700 tons of structural steel and 100 tons of steel piling. The Pennsylvania railroad will open bids Nov. 19 on steel pipe, under the Clayton act.

Seattle—The market has developed the best activity of the year as funds have been released to aid municipal improvements and extensions. Nearly 3000 tons are up for figures and other projects are about to be out definitely within a month.

San Francisco—More inquiries for cast iron pipe, over thirty, are now up for figures than ever before in the history of the Pacific coast. Close to 10,000 tons are pending. The largest inquiry calls for over 2200 tons for the Vista irrigation district, Vista, Calif., on which alternate bids will also be taken for welded steel pipe and reinforced concrete pipe.

Cast Pipe Placed

550 tons, 12-inch and under, Amesbury, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

300 tons, Northbridge, Mass., to Warren Foundry & Pipe Corp., Everett, Mass.

245 tons, 6 and 8-inch, Sturbridge, Mass., to Warren Foundry & Pipe Corp., Everett, Mass.

100 tons, 4-inch, United States Indian Service, Billings, Mont., to unnamed interest.

Cast Pipe Pending

1396 tons, 8 to 26-inch, Vista irrigation district, Vista, Calif., PWA project 1159; bids Nov. 19.

1211 to 1300 tons, 12 and 16-inch, San Francisco; bids Nov. 18.

1000 tons, 10-inch and under, West Newbury, Mass.; bids Nov. 25.

820 tons, 8 to 18-inch, Vista irrigation district, Vista, Calif., PWA project 1319; bids Nov. 19.

800 tons, 8, 12, 16 and 20-inch, Eugene, Oreg.; bids Nov. 27.

750 tons, 6 and 8-inch, Sudbury, Mass.; bids Nov. 19.

710 tons, 12-inch and under, Bernardston, Mass.; bids Nov. 26.

705 tons, 4, 6 and 8-inch; Oakridge, Oreg.; bids Nov. 27.

525 tons, 12-inch and under, Northboro, Mass.; bids in.

375 tons, 6 and 8-inch, Public Service Corp. of New Jersey for Newark.

342 tons, 6 to 12-inch water system, Beverly Hills, Calif.; general contract to Fred W. Weber, South Gate, Calif.

260 tons, 4 and 6-inch, Port Orchard, Wash.; bids Dec. 2.

250 tons, 18-inch and under, sewer, section J-1, Saw Mill project, Westchester county, N. Y.; bids Nov. 29.

250 tons, 4, 6 and 8-inch, Hampstead, Md.; bids Nov. 23.

240 tons, 16-inch, Chehalis, Wash.; bids Dec. 2.

203 tons, fittings for 3 to 24-inch pipe, Chicago; bids Nov. 20.

200 tons, 6 and 8-inch, Amity, Oreg.; bids Nov. 27.

150 tons, Kettle Falls, Wash.; Herber & Sheldon, Tacoma, general contractors.

125 tons, 4 and 6-inch, Middleton, Oreg., alternate for steel pipe; bids in.

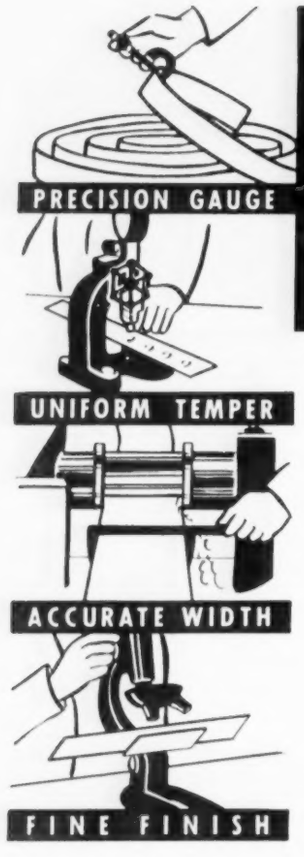
115 tons, 6 and 8-inch, Easton, Mass; bids Nov. 27.

Unstated tonnage, water system extension, Umatilla, Oreg.; bids Nov. 23.

Steel Pipe Pending

1065 tons, 35 miles of 8 and 10-inch line pipe, from Kettleman Hills to Estero Bay, Calif., for Standard Oil Co., San Francisco.

528 tons, 10 miles of 6-inch, water and power department, Los Angeles, specification 1830; bids Nov. 20.



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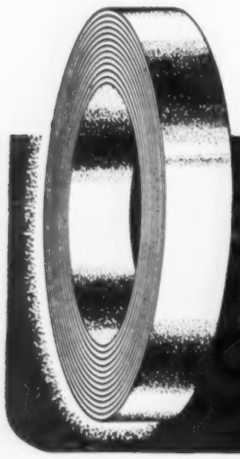

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Strip Steel

Strip Prices, Page 73

Pittsburgh—Strip steel producers have delayed naming new prices. Some interests have favored a $2 a ton increase for both hot and cold-rolled, while others believe hot rolled should be advanced $3 a ton, with cold rolled possibly $5. As there is no immediate rush to name strip prices, announcements may be delayed for several weeks. Meanwhile, hot-rolled strip holds at 1.85c, Pittsburgh, and cold rolled, 2.60c, Pittsburgh or Cleveland. Producers are now running at 55 per cent on hot-rolled grades and 60 per cent on cold rolled.

Cleveland—Specifications from au-

tomobile manufacturers are heavy, and in some instances orders have been booked for specifications in December and shipment in January.

Chicago—New strip business is heavier, stimulated by consumers' expectations of higher prices. The increase in new business is larger than that in specifications, which generally hold around recent levels. Betterment in automotive demand is looked for shortly in view of heavy automobile schedules projected for the balance of the year. Specifications from other consumers are fairly steady.

Boston—Cold strip operations in New England average close to 75 per cent. While there is some buying for delivery Dec. 15 and later, most orders are for rush delivery. Hot strip is also active. What advanced buying is done is credited to expected price increases. Meanwhile cold strip is steady at 2.80c, Worcester.

Philadelphia—Possibility of higher prices is resulting in protective contracting for over the remainder of the year, with some actual improvement in specifications. However, general volume reflects only a minor gain from a week ago. Hot strip is 1.85c, Pittsburgh, or 2.16c, Philadelphia; and cold strip 2.60c, or 2.91c.

Wire

Wire Prices, Page 73

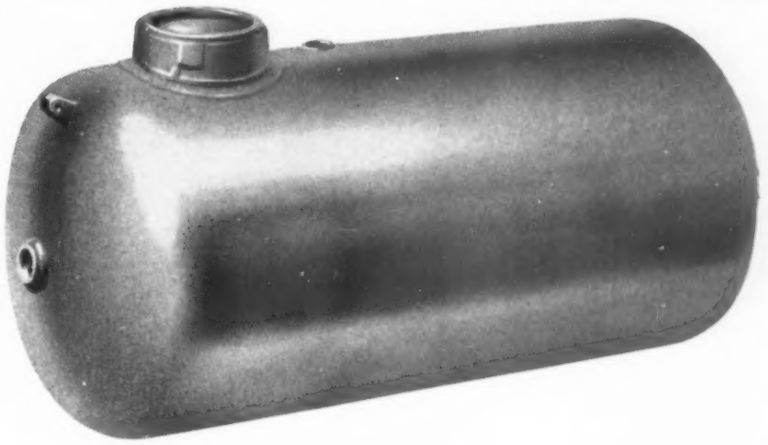
Pittsburgh—A $3 a ton advance in plain wire and spring wire is likely to be undertaken in the near future, according to preliminary reports last week. This would advance the present bright wire base, Pittsburgh or Cleveland, from 2.30c to 2.45c, and spring wire from 2.90c to 3.05c. In spring wire it would, in part, recompense producers for the $6 a ton price reduction made late in 1934. Though a price increase on wire products appears a foregone conclusion, consumers will be given opportunity to enter specifications for shipment over the balance of this quarter, so that the general effect of the price increase will be delayed until Jan. 1. About 220 tons of steel strand cable and 700,000 square feet of galvanized wire fabric for the Vicksburg, Miss., engineers are now being fabricated by Monessen, Pa., and Youngstown, O., producers.

Cleveland—Demand for manufacturers' wire is strong, and represents actual consumer requirements, little speculative buying being done. Production here has shown little variation for several weeks, and is at a higher average for this time than in any year since 1930. Nut and bolt manufacturers, shipping more than 50 per cent of their output to automobile manufacturers, are the leading consumers.

Chicago—Wire sales are heavier, while specifications lag slightly. The increase in new business to a large extent is ascribed to expectations of higher prices. Automotive demand has been relatively quiet as a result of the lull which ordinarily accompanies the show period. Miscellaneous consumers of manufacturers' wire show only a small change in requirements. Demand for merchant products remains spotty, with sales in farm districts still below expectations. Prices of wire, wire products and wire rods for first quarter are expected to be announced soon.

Boston—Wire buying, specialties and manufacturers' wire especially, is heavy, incoming orders holding to the recent rate. Prices are firm and there is talk of an increase in wire rods of $2 a ton on next quarter business.

Award of 110 tons of nails for work on the tidal project, Eastport, Me., went to two sellers, Wickwire Bros., Cortland, N. Y., booking 125,000 pounds common wire nails.



A DEEP DRAWN SPECIAL SHAPE

For a number of important concerns, Pressed Steel Tank Company has successfully provided special deep drawn shells and shapes that meet requirements efficiently and economically.

The above tank for use on chemical fire extinguisher engines, is made by the Hackney deep drawn method. The smooth surface permits a fine painted finish. Terne coated or hot dip galvanized finishes are also available.

Hackney seamless bilged barrel, with raised openings that prevent entry of foreign matter, even when plugs are removed

For a wide range of special shapes and shells, the Hackney deep drawing method of manufacture means uniform temper and thickness, prevention of laminations in the metal. Steel, stainless steel, aluminum, monel metal, nickel, Herculoy, copper, brass, bronze and various alloys are among the metals that can be worked.

Send us your problems in special shapes, shells, tanks, bottles, etc. Let Hackney engineers study them, with a view to recommending improvements.

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Hackney
MILWAUKEE

DEEP DRAWN SHELLS AND SHAPES

4d to 60d, at $4528.25, and Haynes & Chalmers Co., Bangor, Me., took 75,000 pounds of miscellaneous nails and brads for flooring, roofing and plastering, at $3007.59, both prices being for delivery. This is the largest purchase of nails in this district for a long period.

Philadelphia—While there has been a falling off in agricultural demand for wire in the Southwest, this business is still better than seasonal and a brisk demand prevails for manufacturer's wire, a development which may be accounted for in part by the possibility of higher prices.

Shapes

Structural Shape Prices, Page 72

New York—Awards are light, but include 3300 tons for the first section, Sixth avenue subway, the first structural material let for new subway work in several years. Pending tonnage is heavy. On many public work projects under the PWA program bids are being taken for foundations or excavation only as municipalities must have some work under contract on these projects before Dec. 15 to be qualified for the loan or allotment. In numerous instances the superstructures, requiring structural steel will not be bid until spring. Considerably more steel is pending for projects in New Jersey.

Pittsburgh—Inquiry for approximately 17,000 tons of structural shapes came out last week in various sections of the country. Philadelphia has a public school building program, involving about 23 buildings. Plain structural shapes hold at 1.80c, base, Pittsburgh.

Cleveland—The market is more active, particularly in public work. Schools and grade crossings promise to develop substantial tonnages, shortly. Toledo, O., board of education is taking bids this month on 19 school jobs, requiring about 500 tons of shapes, and the Cleveland board of education has a program for repairs and alterations calling for expenditure of $1,500,000. A large proportion of projects in Ohio financed with federal funds and recently approved are for schools. Grade crossing work also is becoming more active, 2000 tons pending for such projects in this district.

Chicago—Structural awards and inquiries are heavier, with state bridge work continuing to supply the largest tonnages. Bridge inquiries include 4000 tons at Weldon Springs, Mo., 1825 tons in Nebraska and 1075 tons additional in Missouri. Orders are more numerous, though individual lots are confined to less than 1000 tons. Specifications for plain shapes are steady.

Boston—Structural steel awards are light, although inquiry is gradually mounting, notably for schools. Practically all demand is for public works, slow to mature into contracts. Bridge requirements are small following the placing of 455 tons for a span at Waltham, Mass.

Philadelphia—While district fabricators are figuring on a substantial tonnage, the great bulk of it comes from outside the district. One of the largest outside jobs involves 2000 tons for the Archives building addition in Washington on which two

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Superior Steel Corporation

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3122 Grant Building
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WORKS AT
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SALES OFFICES
4305 Chrysler Bldg.
New York City
1017 Fisher Bldg.
Detroit, Mich.
2002 Girard Trust Bldg.
Philadelphia, Penna.

Steel Sales Corp.
129 South Jefferson St.
Chicago, Ill.

H. L. Brown,
2001 Carew Tower
Cincinnati, Ohio

Shape Awards Compared

	Tons
Week ended Nov. 16	19,795
Week ended Nov. 9	21,750
Week ended Nov. 2	23,041
This week, 1934	17,651
Weekly average, 1934	16,284
Weekly average, 1935	16,972
Weekly average, October	18,957
Total to date, 1934	769,281
Total to date	780,732

general contractors in this city were low, on two previous openings. A price advance in shapes by the first of next year appears probable. The present price is 1.90c, Bethlehem, Pa., or 2.01½c, Philadelphia.

St. Louis—Stupp Bros. Bridge & Iron Co., St. Louis, has been awarded approximately 700 tons for the Granite City Steel Co.'s new strip mill building, Granite City, Ill. The same interest booked 320 tons for Missouri Pacific railroad bridges.

Birmingham, Ala.—Operations at structural fabricating shops in this district are steady. Virginia Bridge & Iron Co., Birmingham, will furnish 480 tons of steel for locks and hurricane structures on Okeechobee lake, Florida.

San Francisco — Close to 2000 tons of structural shapes were placed during the week, which brought the aggregate for the year to 105,869 tons, compared with 111,945 tons for the same period a year ago. Consolidated Steel Corp., Los Angeles, booked 600 tons for an addition to the Douglas Aircraft Co.'s plant in Santa Monica, Calif. New inquiries include 650 tons for an overhead crossing at Wilmington, Calif., up for figures Nov. 29. Grade separation work is becoming more pronounced each day, and pending requirements now exceed 10,000 tons.

Seattle — Increased demand for structural steel is noted, with several important awards including: 590 tons, bridge at Eagle, Oreg.; 420 tons, Bonneville, Oreg., power house and 400 tons, state bridge, Clearwater river, Idaho. Bids have been opened for two 300-ton indoor traveling cranes for the Bonneville power house, with other material totaling 1500 tons.

Shape Contracts Placed

3300 tons, subway, Sixth avenue, Fortieth to Forty-seventh street, Manhattan, New York to American Bridge Co., Pittsburgh, Rosoff-Brader Construction Co., general contractor.

1280 tons, structural steel for railway bridge, Wheeler dam, Tennessee valley authority project, Knoxville, Tenn., to McClintic-Marshall Corp., Bethlehem, Pa., bids Oct. 14.

800 tons, bridge, Des Moines, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

700 tons, approximately, strip mill building, Granite City Steel Co., Granite City, Ill., to Stupp Bros. Bridge & Iron Co., St. Louis.

630 tons, structural steel for spillway bridge, Norris dam, Tennessee valley authority project, Knoxville, Tenn., to McClintic-Marshall Corp., Bethlehem, Pa., bids Oct. 16.

600 tons, addition to Douglas Aircraft Co. plant, Santa Monica, Calif., to Consolidated Steel Corp., Los Angeles.

590 tons, Eagle, Oreg., state bridge, to Poole & McGonigle, Portland, Oreg.

575 tons, public school 247, Brooklyn, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa., Jonwal Construction Co., New York, general contractor.

465 tons, bridge WPGH 418D, Baraboo, Wis., to Worden-Allen Co., Milwaukee.

460 tons, addition, galvanizing building, Newport, Ky., to International Steel & Iron Co., Evansville, Ind.

455 tons, Beaver brook bridge, Waltham, Mass., to Boston Bridge Works Inc., Cambridge, Mass.

450 tons, bridge, Hand, Mich., to the R. C. Mahon Co., Detroit.

430 tons, school, Whitney Point, N. Y., to Genesee Bridge Co. Inc., Rochester, N. Y.; through William Aderbusse Jr. Inc.

420 tons, state highway bridge RC 3629, Seveys Corners-Colton, St. Lawrence county, New York, to Lackawanna Steel Construction Corp., Buffalo; through Belmar Contracting Co. Inc., Troy, N. Y.

420 tons, Bonneville, Oreg., powerhouse, to McClintic-Marshall Corp., Bethlehem, Pa.

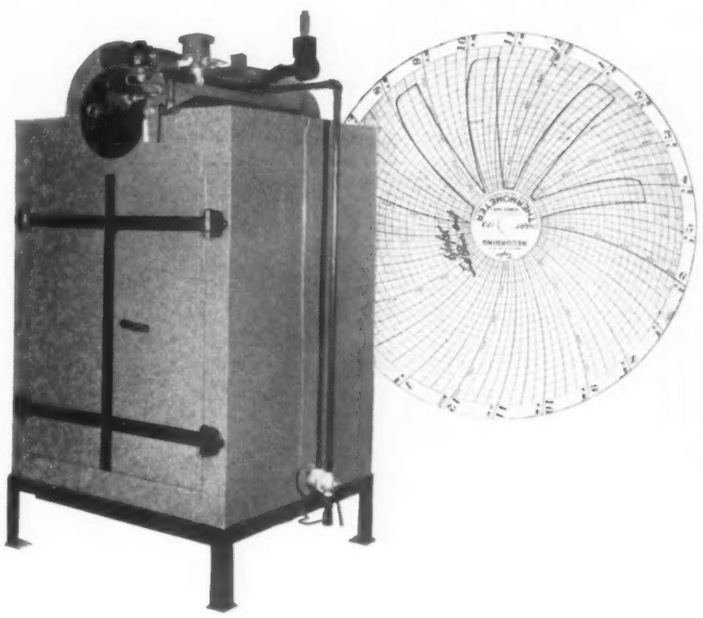
400 tons, state bridges over Clearwater river, Idaho, to McClintic-Marshall Corp., Bethlehem, Pa.

395 tons, schedule 3097, Panama Canal, to unnamed interest.

355 tons, highway project 134A, Laurel, Yellowstone county, Montana, to Minneapolis-Moline Power Implement Co., Minneapolis, Minn.

350 tons, state highway bridge Brighton-Fairfield, highway 60, Monroe county, New York, to McClintic-Marshall Corp., Bethlehem, Pa.;

A PICTURE OF A PROFIT



Here is both cause and effect — efficiency and its immediate effect, profit. By surrounding the heating chamber with a layer of circulating heat, radiation losses are eliminated and a uniformity of temperature within the charge, heretofore impossible, is attained. This new Morrison batch type furnace utilizes the revolutionary Morrison heating unit which provides exact control of both heat and atmosphere, plus extreme economy. There is still more to this interesting story. Let us tell it to you.

THE MORRISON ENGINEERING CO., INC.

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Joseph M. Murray, Rochester, N. Y., general contractor.

350 tons, bridge and underpass, South Huntington avenue, near Riverway and Brookline village, Boston, to Boston Bridge Works Inc., Cambridge, Mass.; Coleman Bros., Boston, general contractors.

335 tons, Central high school, Amherst, N. Y., to Ernst Iron Works Inc., Buffalo.

300 tons, factory building, Wagner Electric Corp., St. Louis, to Stupp Bross Bridge & Iron Co., St. Louis.

276 tons, cafe building, Bell Realty Co., Toledo, O., to Ingalls Iron Works Co., Verona, Pa.

250 tons, piling and I-beams, Panama, to Jones & Laughlin Steel Corp., Pittsburgh, and United States Steel Products Co., New York; bids Oct. 31.

250 tons, warehouse, Streator, Ill., to Ingalls Iron Works Co., Birmingham, Ala.

250 tons, highway bridges, South Dakota, to McClintic-Marshall Corp., Bethlehem, Pa.

250 tons, warehouse, Hiram Walker & Sons Inc., Peoria, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

250 tons, building, International Harvester Co., East Moline, Ill., to Gage Structural Steel Co., Chicago.

230 tons, factory building, Hercules Motor Co., Canton, O., to Canton Structural Steel Co., Canton.

230 tons, two additions for the Du Pont interests at Carneys Point, N. J., to Belmont Iron Works, Eddystone, Pa.

225 tons, state highway bridge 3665, Wayland village highway, Steuben county, New York, to Lackawanna Steel Construction Corp., Buffalo; H. E. Bunce, Hornell, N. Y., general contractor.

225 tons, grade separation, Flint, Mich., to American Bridge Co., Pittsburgh.

225 tons, pump and power stations, sewage works, Columbus, O., to Case Crane & Kilbourne, Jacobs Co., Columbus.

215 tons, state highway bridge, Tunkhannock, Pa., to Fort Pitt Bridge Works, Pittsburgh.

215 tons, state highway bridge, Wyoming county, Pennsylvania, to Fort Pitt Bridge Works, Pittsburgh.

210 tons, warehouse, Zanesville, O., for Hazel-Atlas Glass Co., to McClintic-Marshall Corp., Bethlehem, Pa.

210 tons, state hospital building, Trenton, N. J., to Oltmer Iron Works, Newark, N. J.

200 tons, power plant, Indianapolis, to R. C. Mahon Co., Detroit.

200 tons, bridge, Ruthven, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

200 tons, addition to union printers' home, Colorado Springs, Colo., to E. Burkhardt & Sons Steel & Iron Works Co., Denver.

200 tons, bridge, San Marcos, Tex., to Virginia Bridge & Iron Co., Roanoke, Va.

200 tons, state hospital addition, Trenton, N. J., to N.A.K. Bugbee Co., that city.

200 tons, 80-foot girder span, Chicago, Minneapolis, St. Paul & Pacific railroad, Homer, Minn., to Wisconsin Bridge & Iron Co., Milwaukee.

190 tons, highway project 247 and 256H, Garfield county, Montana, to Minneapolis-Moline Power Implement Co., Minneapolis, Minn.

164 tons, shapes and bars, postoffice, Amsterdam, N. Y., 83 tons of structural steel to Utica Structural Steel Co., Utica, N. Y., and 81 tons of reinforcing bars to Buffalo Steel Co., Buffalo; Ring Construction Co., Minneapolis, Minn., general contractor. Reported in STEEL Nov. 4 as going to unstated fabricators.

160 tons, Roosevelt school, Long Beach, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.

150 tons, state highway bridge X1 of 82-20-1, Dearborn, Mich., to American Bridge Co., Pittsburgh.

145 tons, Williamsburg-Greenpoint Health Center, Brooklyn, N. Y., to Weatherly Steel Co., Weatherly, Pa.; through W. W. Construction Co., New York.

140 tons, postal station H, Manhattan, New York, to Dreier Iron Works, New York; Caulway Inc., New York, general contractor.

110 tons, bridge No. 4192, Washington county, Arkansas, to St. Louis Structural Steel Co., St. Louis.

110 tons, crane runway, specification 1806, water and power department, Los Angeles, to Pacific Coast Steel Corp., San Francisco.

100 tons, sheet piling Puget Sound, Wash., navy yard, to Pacific Coast Steel Corp., Seattle.

100 tons, tunnel ribs, metropolitan water district, Los Angeles, bids 45618, to Youngstown Steel Car Corp., Niles, O.

Shape Contracts Pending

1200 tons, state highway bridge, Weldon Springs, Mo., over Missouri river.

3500 tons, four state highway bridges, Indiana.

3445 tons, including structural steel

FRANK J. CROHAN President

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RIGHT AT GRAND CENTRAL

Just a few steps from trains

liner plates and roadway beams. New Jersey approach to Manhattan-Weehawken Hudson river tunnel; bids rejected.

2000 tons, public school 49, Brooklyn, N. Y. Psaty & Fuhrman Inc., New York, low on general contract, Nov. 12.

2000 tons, addition to Archives building, Washington, bids to be opened Nov. 26; this will be third opening on project; approximately 500 tons of bars also will be required.

1825 tons, state bridges, Nebraska.

1750 tons, Illinois river bridge, Havana, Ill.; bids taken Nov. 15.

1580 tons, state span First avenue south, Seattle; bids in.

1500 tons, two 300-ton traveling cranes Bonneville, Oreg., powerhouse; Harnischfeger Sales Corp., Milwaukee, low.

1200 tons, buildings for United States Pipe & Foundry Co., Chattanooga, Tenn.; bids in Nov. 16.

1185 tons, consisting of 600 tons of carbon structural steel and 585 tons of silicon structural steel, crest gates for dam 17, Tuscaloosa, Ala., for United States engineers' office, Mobile, Ala.; bids Nov. 20. Project includes 45 tons of steel and iron castings, 62 tons of reinforcing steel bars, and 3 tons of steel pipe railing.

1100 tons, highway bridges Nebraska.

1075 tons, state bridges, Missouri.

950 tons, several armories, state of New Jersey; bids in.

900 tons, public school 166, Queens, N. Y.; John A. Kennedy Co., New York, low on general contract, Nov. 12.

800 tons, including 100 tons of piling, for three bridges over the Delaware and Chesapeake canal; bids Nov. 18.

750 tons, Western high school, Detroit.

700 tons, piling, East river drive, Manhattan connection, Triboro bridge, New York; Merritt-Chapman & Scott Co., New York, low.

650 tons, overhead crossing, Wilmington, Los Angeles county, California, for state; bids Nov. 29.

600 tons, University of Cincinnati building, Cincinnati; Frank Messer & Sons Inc., Cincinnati, general contractor.

550 tons, track elevation, East St. Louis, Ill.

500 tons, theater, Stanford university, Palo Alto., Calif; bids being taken.

500 tons, 19 public school jobs, Toledo, O.; bids Nov. 25 to Dec. 9.

482 tons, state crossing, Sacramento, Calif., bids soon.

450 tons, flooring and other alterations, state bridge, Lewisboro, Pennsylvania; new bids opened Nov. 15.

440 tons, municipal bridge, Cincinnati.

400 tons, library, Brooklyn college, Brooklyn, N. Y.

400 tons, livestock exposition building, San Mateo county, California.; bids Dec. 3.

343 tons, Yellowstone river bridge near Laurel, Mont., for state; general contract to W. P. Roscoe, Billings, Mont.

300 tons, shapes and bars, high school, Fitchburg, Mass.; bids Nov. 25.

300 tons, state crossing, San Leandro, Calif.; bids soon.

300 tons, cranes, American Rolling Mill Co., Middleton, O.

300 tons, bridge No. 80, Atlantic division, Louisville & Nashville railroad.

275 tons, high school, Newburyport, Mass.; George A. Fuller Co., Boston, low on general contract.

250 tons, municipal power plant, Vineland, N. J.; bids in.

250 tons, state crossing, Santa Clara, Calif.; bids soon.

224 tons, state underpass, Formosa, Kern county California; bids soon.

180 tons, sheet piling, Puget Sound, Wash., navy yard; bids in.

180 tons, tuberculosis sanitarium, Washington, for District of Columbia; Rosslyn Steel & Cement Co., general contractor.

178 tons, state crossing, Niles, Calif.; bids soon.

174 tons, state bridge in Garfield county, Montana; general contract to Prahy & Sawtelle, Miles City, Mont.

171 tons, state bridge, Thurston county, Washington; bids at Olympia, Nov. 26.

170 tons, Alemedan road subway, San Jose, Calif., for state; bids Nov. 20.

164 tons, state viaduct, Mossmain, Yellowstone county, Montana; general contract to James Crick, Spokane, Wash.

150 tons, Mountain boulevard crossing, Oakland, Calif., for state; bids soon.

150 tons, gymnasium, state college, Amherst, Mass.; bids in.

121 tons, Galena street state bridge, Spokane, Wash; Sather & Son, Seattle, general contractors.

110 tons, shapes and bars, dormitory, state school for girls, Hallowell, Me.; bids in.

100 tons, medical building, University of Illinois, Chicago.

100 tons, high school, Abington, Mass.; bids Nov. 26.

100 tons, school, West Boylston, Mass.; bids Nov. 25.

100 tons, country bridge, York county, Pennsylvania; bids opened Nov. 14.

Unstated tonnage, $1,400,000 high school, Lancaster, Pa., funds approved.

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Reduce Dead Weight

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● This new super strength steel embodies *every* qualification demanded by modern engineering for a higher strength steel carrying less bulk and less weight.

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1. HIGH STRENGTH . . .
   Yield Point (Lb. per sq. in.) . . 70,000 min.
   Tensile Strength (Lb. per sq. in.) 90,000 min.
   Elongation (% in 2 in.) . . . . . 20 min.
2. WELDABILITY . . .
   Excellent (no treatment required to prevent brittleness.)
3. CORROSION RESISTANCE . . .
   Superior to all ordinary steels.
4. FABRICATION . . .
   Cold Bends 180° flat upon itself.

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109 YEARS' STEEL MAKING EXPERIENCE

Reinforcing

Reinforcing Bar Prices, Page 73

New York—Still shopping for price concessions, contractor-buyers are delaying placing a large part of the heavy tonnage pending in this district. New work is coming out in excess of awards. New volume up for bids in New Jersey is heavier, both for highways and sewer projects. Weekly openings for New York state highway and bridge projects add steadily to the pending volume. On the limited amount of business placed prices are somewhat steadier.

Pittsburgh—A considerable tonnage of reinforcing steel will be purchased for six projects in the state of Pennsylvania's letting of Nov. 8. Among new bar inquiries are 500 tons for a housing project at Rosslyn, Va.; 640 tons, naval ammunition depot at Balboa, Canal Zone; 150 tons, sewage treatment works, Elmira, N. Y., and large but unstated tonnages for a number of housing projects in the Midwest. Reinforcing steel bars hold at 2.05c, base, Pittsburgh, for new billet quality bars, and 1.90c for rail steel bars; both are distributors' prices, with $4 less being the allowable mill base.

Cleveland—Truscon Steel Co. has taken 1100 tons of reinforcing bars for the Whiskey island, Cleveland, federal housing project, this making the third of such projects in Cleveland booked recently by this interest, aggregating 3300 tons. For buildings at Cleveland's easterly sewage disposal plant, 360 tons were placed with Patterson-Leitch Co., Cleveland. For pending grade elimination work in Cleveland and nearby, fabricators estimate about 1000 tons of bars will be required.

Chicago—Prospective business in concrete bars is increasing and a large number of public jobs shortly will be up for bids. Chicago sanitary district has thrown out bids on work involving 1700 tons and new tenders will be taken. The Hammond, Ind., overhead crossing involves 550 tons with an even larger tonnage required for other highway work in Illinois and Indiana. Orders include more than 500 tons for Illinois bridge work. Private building activity still is limited to small lots of bars.

Boston—Reinforcing steel inquiry is heavier for sewers, although the largest projects of this type in the Connecticut district have been placed. A Vermont state bridge will require 200 tons, while foundations for the Old Harbor village housing project, Boston, on which bids are in, call for 250 tons. Reinforcing bar prices in this district continue irregular.

Philadelphia—While little tonnage has been placed recently, reinforcing bar demand continues to expand. More tonnage is now active than in many months. School work in Philadelphia probably constitutes the largest item. Reinforcing bar prices are still unsettled.

San Francisco — Over 1200 tons of reinforcing bars were placed during the week, bringing the total for the year to 197,114 tons, compared with 94,944 tons in the same period in 1934. Included among the larger awards was 200 tons for an addition

Behind the Scenes with STEEL

Twisters

THE fellow who sets the type for this weekly effusion has a pretty soft time of it—no long words, formulas, superior figures or other doo-dads. This thought occurred to us as we scanned through the smooth pages of Bakelite's 25th anniversary booklet which is a dandy, incidentally.

Just suppose, for example, we had a habit of using the word oxybenzylmethylenglycolanhydride, which, so the booklet tells us, is the nickname for Bakelite. The latter was thought up, as you probably know, to honor the discoverer of the material—Dr. L. H. Backeland. Try rolling that oxybenzylmethlyenglycolanhydride off the end of your tongue a few times. Once you get the swing, it's like a college football cheer.

Then we might tie up our linotype and proofroom force by sticking the word "monoaceticacidester of salicylicacid" in our copy occasionally, instead of the conventional term "aspirin." Or, we might set out to discuss the merits of "antidisestablishmentarianism" as a creed. Maybe some of our readers can suggest a few more 40-cent words to heave at our composing room.

* * *

Hamlet

SOMEONE calls our attention to the fact that in STEEL for Nov. 11 it was noted that Bell Buckle, Tenn., is planning a waterworks. He thinks we ought to say something funny about that name for a town. We'd better not, however; an angry chamber of commerce is a bad thing to have on your neck. Now if that were only *Belt* Buckle, Tenn., we might really get going on it.

* * *

Whose Zoo?

A RUGGED individualist from the Berkshire Hills rises to remark that he notes $250,000 has been earmarked under the federal building program for the erection of a building at Washington for "small mammals and great apes." He makes no comment but the thought occurs to us that there has always been a building there for Congress; why throw up another?

* * *

Lost "t"

EAGLE-EYED J. C. S. of Buffalo pounces on an error in a recent issue where reference was made to the "American Society for Meals." He asks, "What is it all about?" Just one of the many reasons, Mr. S., why most editors, when they reach a certain age, start to shake, jump, mutter and see strange shapes floating through the air at night.

* * *

Rhymester

CELEBRATING the second anniversary of the original publication of this poem in *Metals and Alloys*, we reproduce it here, with an appreciative nod to the editor of *M. and E.* The bard is Fred P. Peters. Give:

FOREVER STEEL

A bar of steel may pass through rolls
And hot or cold will lose its form,
Acquire machine made shapes that take
Their measure from the impress warm.

How different then the steel appears—
Gone is the roughness, gone the scale;
Against the change wrought by the rolls
No shape or structure could prevail.

But length may grow and surface chance,
The bar of steel may seem to be
In color, form and temper, then,
A new, a transformed entity.

This is not so!
For steel is steel!
No human agent can transmute
Its heart, its soul, its nature deep
Into some other substance cheap!
And though you think it's not the same—
IT IS! . . . . .

We felt the hammers and the rolls,
The grinding clash of steel on steel,
The shock of outlines formed anew,
All these, within ourselves, we feel.

Our temper may have changed, perhaps,
The rolls have made our lines less clear,
We do not seem to be the steel
That once was held so very dear.

How dull, they say, this new one seems,
How lifeless, how devoid of soul!
Once more the ever-turning rolls
Achieve their own apparent goal!

But this I know:
Still we are steel!
No matter how our surface seems
It has no bearing on our heart;
This has not changed the smallest part.
And though they shout we're not the same,
WE ARE! . . . .

Rhyme Marches On!

SHRDLU

Concrete Awards Compared

	Tons
Week ended Nov. 16	3,640
Week ended Nov. 9	17,916
Week ended Nov. 2	5,522
This week, 1934	1,100
Weekly average, 1934	4,084
Weekly average, 1935	7,085
Weekly average, October	7,383
Total to date, 1934	203,127
Total to date, 1935	325,924

to the American Can Co. plant, Sacramento, Calif. Numerous grade separation and dam projects, now out for bids, will require more than 20,000 tons of bars.

Seattle — State building projects and school construction in Oregon and Washington, up for bids, require approximately 10,000 tons of reinforcing bars. Montana has awarded more than $1,000,000 worth of highway contracts including bridges, taking considerable reinforcing material.

Reinforcing Steel Awards

1100 tons, Whiskey island, Cleveland, federal housing project, to Truscon Steel Co., Youngstown, O.

450 tons, tuberculosis sanitarium, Washington, for District of Columbia, to Rosslyn Steel & Cement Co., Washington.

375 tons, bridge, Lake county, Illinois, to Calumet Steel Co., Chicago.

360 tons, buildings at easterly sewage disposal plant, Cleveland, to Patterson-Leitch Co., Cleveland.

300 tons, Illinois river lock, Peoria, Ill., to Inland Steel Co., Chicago.

250 tons, United States court house, Buffalo, to Kalman Steel Corp., Bethlehem, Pa.; Fleisher Engineering & Construction Co., St. Paul, Minn., general contractor.

200 tons, bridge, Gurnee, Ill., to Concrete Engineering Co., Chicago.

200 tons, addition to American Can Co. plant, Sacramento, Calif., to Truscon Steel Co., Youngstown, O.

194 tons, state crossing in Orange county, California, to unnamed interest.

111 tons, state highway work in Kern and Los Angeles counties, California, to unnamed interest.

100 tons, culvert for United States treasury department, Woodside, Calif., to unnamed interest.

Reinforcing Steel Pending

9128 tons, Imperial dam desilting works, All-American canal system, Yuma, Ariz., placing; bids Nov. 21.

3241 tons, wash siphon structures, All-American canal system, Yuma, Ariz., bids Nov. 25.

1700 tons, Chicago sanitary district sewers; new bids to be taken.

1275 tons, placing, Seminole dam, Casper-Alcova project, Wyoming; bids Nov. 26.

1000 tons, two schools, Philadelphia, McCloskey & Co., that city, low on both projects.

640 tons, naval ammunition depot, Balboa, Canal Zone; Tucker & McClure, Cristobal, Canal Zone, general contractors.

600 tons, federal housing development, Atlantic City, N. J.; bids opened Nov. 15.

550 tons, bridge, Hammond, Ind.

500 tons, Colonial housing project, Rosslyn, Va.

500 tons, Archives building addition, Washington; bids to be opened Nov. 26; this will be the third opening on this project; approximately 200 tons of shapes also will be required.

490 tons, state overhead crossing at Calwa, Fresno county, California; bids soon.

475 tons, state highway bridge, Newburyport, Mass.

420 tons, state overhead crossing near Tracy, San Joaquin county, California; bids Nov. 27.

354 tons, crossing at Niles, Calif; bids soon.

300 tons, buildings, specification 7819, Balboa, C. Z.; general contract to Tucker McClure, Los Angeles.

250 tons, state road work, Huntington county, Pennsylvania; Burket & Co., Pottsville, Pa., low on general contract.

250 tons, foundations, housing project, Old Harbor village, Boston, J. F. Fitzgerald Construction Co., low on general contract, $523,784; bids Oct. 31.

238 tons, state overhead crossing, Wilmington, Los Angeles county, California; bids Nov. 29.

215 tons, sewage disposal plant, New Brunswick, N. J.

200 tons, three state bridges, Vermont; bids in.

175 tons, work at the Philadelphia navy yard; bids asked.

168 tons, state highway work, Blair and Huntingdon counties, Pennsylvania; R. C. Burket, Pottsville, Pa., low on Nov. 8 bids, at $344,561.27.

160 tons, natatorium, Haywards, Calif.; bids opened.

150 tons, state paving job, Palouse county, Washington, bids soon.

150 tons, substructure, Beaver Brook bridge, Waltham, Mass.; H. L. Hauser Building Co. Inc., Boston, low.

150 tons, state crossing, Williams street, San Francisco; bids soon.

150 tons, sewage treatment works, Elmira, N. Y.; bids Nov. 18.

150 tons, state road work, Susquehanna

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All Lake Superior grades of iron ore

Five established brands of

PIG IRON

Federal Perry Iroquois
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For foundry, industrial and domestic uses

Chicago Solvay
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COAL

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county, Pennsylvania; David Risser, Lebanon, Pa., low on general contract.
140 tons, building, Rhode Island School of Design, Providence, R. I.
130 tons, state underpass, Spokane, Wash.; C. A. Powers, Spokane, general contractor.
137 tons, Missouri river bridge, Weldon Springs, Mo.; bids Nov. 26.
125 tons, state road work, Mifflin county, Pennsylvania; contractors' bids opened Nov. 15.
125 tons, state road work, Juniata county, Pennsylvania; bids opened Nov. 15.
100 tons, state crossing, San Leandro, Alameda county, California; bids soon.
100 tons, state crossing, Santa Clara, Calif.; bids soon.
100 tons, state crossing near Indio, Riverside county, California; bids Nov. 29.
Unstated tonnage, Oklahoma City, Okla., housing project; Zanders Contracting Co., general contractor.
Unstated tonnage, Shenandoah-Great Smoky, Va., highway and bridge project; rail steel specified.

Pig Iron

Pig Iron Prices, Page 74

Pittsburgh — Shipments are proceeding against heavy contracts for pig iron negotiated prior to the price increase on Nov. 1. There is practically no test of the new prices and probably will not be until the first quarter of 1936. In the meantime, producers are quoting foundry grades nominally $19.50, Pittsburgh district furnace, basic $19, and bessemer $20.

Cleveland—The market continues strong, with shipments from merchant furnaces so far this month 15 per cent ahead of those in the comparable period in October. Automobile and agricultural implement foundries are taking the larger share of the tonnage, and comparatively little is going to railroads and car builders. Steel foundries are more active than recently. Current sales are limited to small lots.

Chicago — Pig iron shipments continue to increase as consumers are starting to take delivery of iron bought in anticipation of first quarter needs. While foundry operations gradually are improving, the upturn in pig iron deliveries is accounted for largely by speculative buying prior to the recent price increase. New business is quiet with the $19.50, furnace, price for No. 2 foundry and malleable prevailing.

Boston — Shipments specified against recent heavy purchases are encouraging, although new buying since the price advance has been light. Imports of Dutch iron increased last week, with 3600 tons arriving for Providence, R. I. and Boston, to go into storage for spot sales. Except for one brand, foreign iron is up slightly, but is still available under domestic producers' quotations.

New York — Pig iron melt in this district continues to expand, but in view of the heavy protective buying last month, prior to the price advance, new tonnage is lagging. The extent to which consumption is improving, however, may result in less iron being carried over into next year than originally expected.

Philadelphia — Good shipments continue to feature the pig iron market, despite the falling off in new orders. This latter may be attributed to substantial buying last month prior to the advance in prices. For most sellers, incidentally, pig iron buying in October was the best in many months.

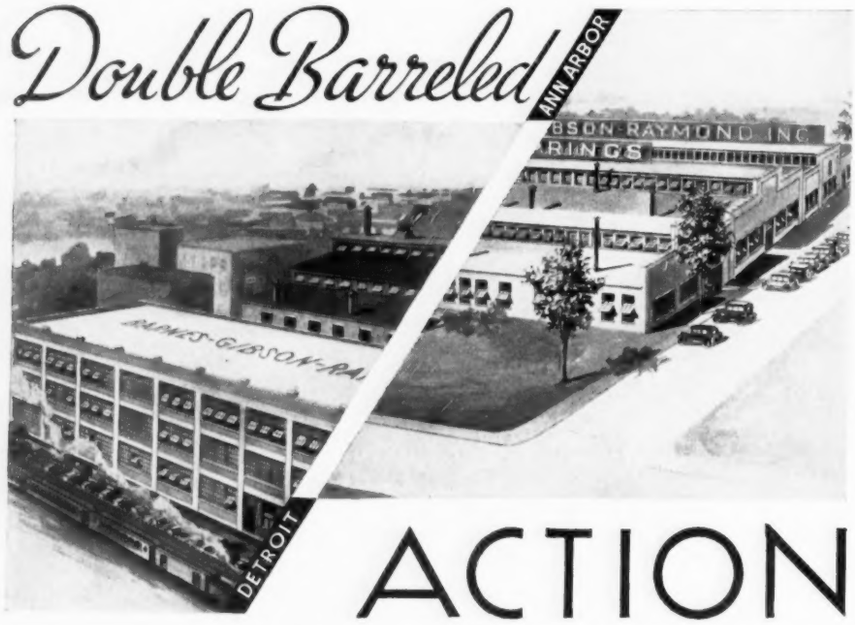
Buffalo—New orders have declined sharply since the price increase and November bookings are almost negligible. Producers are now pressing consumers for shipping instructions, fearing rush of releases in December. Upwards of 2500 tons of iron is being shipped by canal this week to close the 1935 navigation season on the state waterways.

Cincinnati — Pig iron shipments continue at the October level with no specifications so far on iron bought before the price increase for inventory. New purchasing is dull, as most requirements were covered before Nov. 1. The melt for machine tools shows an increase.

St. Louis—With new purchasing reduced to a minimum since the recent advance of $1 per ton, sellers of pig iron are confining their activities to getting tonnage to consumers. Some lots are being sold currently, mainly to the smaller melters who failed to cover and iron of special analyses. Except in the case of lines sensitive to seasonal influences, there has been no indication of reduction in activities, the melt as a whole maintaining its recent high rate.

Birmingham, Ala.—Steady movement of iron from blast furnaces indicates melters are operating at a good rate. Sales made for delivery during December aggregate fair. Nine blast furnaces are in operation in this district, five on foundry and four on basic iron.

Toronto, Ont.—New business is holding at a steady rate. Sales for the week totaled 700 to 800 tons. Melters are not placing forward delivery contracts. A few, however, have stocked 200 to 300 tons for future needs.



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Quicksilver

New York — Quicksilver prices are steady in a quiet market. Sup-

plies of domestic metal are still limited here, sellers quoting small lots $75 to $76, a virgin flask of 76 pounds.

Scrap

Scrap Prices, Page 75

Pittsburgh—The recent $13.75 No. 1 heavy melting steel price paid by the leading local interest was followed last week by a purchase at $14 on the No. 1 heavy melting grade by a district sheet and tin plate mill. In spite of renewed consumer interest in scrap, the market is difficult for brokers, who find available supplies held tightly in anticipation of better offers; consequently, $13.50 has been freely paid by brokers against $13.75 orders. Both scrap rails and railroad heavy melting steel have advanced 50 cents a ton and are firm at $14.50 to $15.00.

Cleveland—Strength accompanied by small sales and unchanged prices, characterizes the market for steel and iron scrap here and in the valleys. Shipments on contracts continue fair. High rate of steel production is eating into mill reserves and stocks in the hands of dealers are light.

Chicago—Reflecting the upward tendency in brokers bids recently, a sale of heavy melting steel has been made to a mill at $13.50, an increase of 50 cents a ton over the previous market. Compressed sheets, shoveling steel, busheling and No. 2 railroad wrought are up similarly. Supplies of scrap continue limited and sellers find difficulty in picking up large lots of heavy melting steel at $13. The market currently is at the highest level in more than five years.

Boston—Domestic demand for scrap continues dull with New England consumers of steelmaking grades refusing to meet dock export prices. Meanwhile buying for export has assumed its former active pace at stronger prices with more going to Italy. Shippers pay $9.75, dock, for No. 1 and $8.75 for No. 2, the latter moving in the greater volume.

New York—The recent advance in pig iron has failed to strengthen cast scrap prices, sellers having difficulty securing as high prices as three weeks ago. Some shipments against contracts for No. 2 heavy melting steel from northern New Jersey to eastern Pennsylvania are being made at around $11, delivered, or $8.25 to $8.40, cars, shipping point. Bridgeport, Conn., takes a barge from time to time for New York, but having a large supply of scrap, is not pressing for material. Some buying is being done for export at unchanged prices.

Philadelphia—An advance in railroad malleable to a spread of $14 to $14.50, delivered consuming point, is the only price revision in the local market. This is the first change in malleable in several weeks and reflects increased operations at malleable foundries. No. 1 heavy melting steel is moving against new orders to Phoenixville, Pa., and Claymont, Del., at the unchanged price of $12. In general, demand continues spotty. The leading eastern Pennsylvania consumer of No. 1 melting steel is paying $11.50 for Steelton, Pa., mostly local shipments, and $11 to $11.75 for Bethlehem, Pa. For Sparrows Point, Md., this consumer has dropped his price 50 cents a ton to $11, delivered, for No. 1 steel and $10 for No. 2, closing on fair tonnages at these levels.

Buffalo—Scrap buying is on a narrow scale, owing to efforts of consumers to buy below dealer prices. There have been a few small sales of No. 2 heavy melting steel at $9.50, equivalent to $11 for No. 1, but the tonnage was not such as to establish this as a going market, it is claimed.

Bethlehem Steel Co. has issued an embargo on scrap at Lackawanna, N. Y., said to be due to heavy receipts by water, taxing unloading facilities. Rail scrap would be subject to yard demurrage and will not be taken in until after Nov. 25, it has been indicated.

Detroit—The downward trend in scrap appeared to be arrested last week, and in spite of heavier automotive offerings there was a firmer buying tendency. Automotive scrap lists have mounted to a point where compressed sheet offerings in 50-car lots are frequent. No. 1 heavy melting steel is quoted $9.50 to $10, hydraulic compressed sheets, $9.75 to $10.25, and machine shop turnings, $5 to $5.50. The only continuing weak spot is in blast furnace scrap, which is nominally $5.25 to $5.75.

Cincinnati—Iron and steel scrap prices are unchanged but firmer despite mills' resistance. Purchasing in small lots is steady and shipments are without interruption.

Birmingham, Ala.—Activity of pig iron is reflected in the iron and steel scrap market. Heavy melting steel is held at $8.50 to $9.50 and little movement is noted, one of the larger consumers dipping into the market at intervals.

Seattle—Prices remain firm, due to active domestic interest. Exporters get little encouragement from Japanese connections. Oriental prices are lower than ideas of sellers on this side.

St. Louis—While purchasing of

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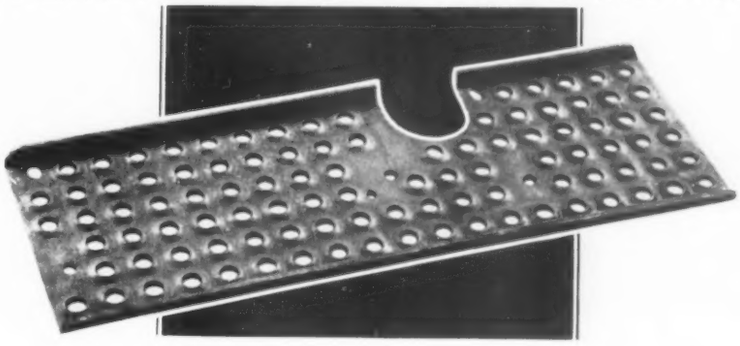

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iron and steel scrap is irregular and in light volume the market is strong throughout. The recent purchase of 5000 to 6000 tons of heavy melting by an east side mill has resulted in particular firmness in the grades involved.

Toronto, Ont.—Trading in iron and steel scrap is increasing at a steady rate. While current sales mostly are in steel grades there also has been betterment in iron. Local dealers are shipping large tonnages of heavy melting steel and other lines to Hamilton mills.

Warehouse

Warehouse Prices, Page 76

Cleveland—Demand is not as brisk as in October, leading sellers reporting a decline of 15 to 20 per cent so far this month. Orders for the higher finishes of sheets are slightly heavier, due to the strong demand on mills from automobile manufacturers.

Chicago—Sales are commencing to show the gradual slackening, which is common for this period. A downward tendency is expected to prevail until January. Prices are unchanged.

Philadelphia—Following a fair start early in the month, jobbing demand has tapered off, with the possibility that the showing for November will not equal that for October.

Boston—Sales, which have been heavy for several weeks, show further improvement with talk of advanced prices by mills on several products. Volume is made up mostly of numerous small-lot shipments, with specialty lines active. Jobbers outside the Boston district have shared in the improvement.

New York—While sales continue active, volume is somewhat below that of last month, but ahead of the same month, 1934. Specialty steels, cold-finished and alloys, however, hold in volume, and some gains are reported. Standard lines are well spread. Prices are unchanged, but confusion prevails for galvanized sheets.

Detroit—Steel jobbers, contrary to adjoining warehouse centers, continue to quote steel bars on the basis of a single price of 3.09c for delivery within the metropolitan area. In other districts the price of bars has been changed recently by establishing two classifications. Sales have picked up so far in November, following a downward trend the last half of October.

Cincinnati—Sales are well diversified, although total tonnage is tending downward slightly from October levels, possibly due to seasonal influences. Prices remain steady.

St. Louis—Distribution continues to run slightly above the corresponding period in October. Further expansion in general demand is accounting for a substantial volume and diversity of commodities.

Cold Finished

Cold Finished Prices, Page 73

Pittsburgh — From reports that hot-rolled steel bars may not be advanced it appears that the cold-drawn market may also remain unchanged for first quarter. Orders for cold-finished bars have improved slightly so far in November over October.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 73

Bolt and nut producers probably will increase prices from the present 75 off list if anticipated price increases on steel bars and rods are announced. Large rivets remain quoted 2.90c, Pittsburgh and Cleveland, 3.00c, Chicago, and small rivets, 70-5 off list.

At Cleveland bolt and nut specifications so far this month are about 20 per cent heavier in the aggregate than in the comparable period in October. This gain is due mainly to automotive requirements. Inquiries for large quantities of bolts and nuts are being received from railroads and carbuilders. Demand from agricultural implement manufacturers is off slightly, and that from hardware jobbers, slow.

Tin Plate

Tin Plate Prices, Page 72

Pittsburgh — From many indications last week, it appeared that tin plate prices will not be advanced for next year. If such a policy is adopted, nonintegrated tin plate producers say they will be at considerable disadvantage. They estimate that the $2 a ton advance in semifinished steel, plus other increased costs, will add about 35 cents in costs per base box. Last week the rate of tin plate mill operations advanced about 10 points to 70 per cent of capacity, an unusually high showing for this season of the year.

New York—Leading trade opinion at the moment is that there will be no change in tin plate prices for next quarter. Meanwhile, specifications are holding up better than usual at this time. The Continental Can Co. is said to be producing beer tin cans at the rate of 750,000 per day, with an increase to 1,000,000 cans likely by Dec. 1.

Semifinished

Semifinished Prices, Page 73

Pittsburgh — Consumers of semifinished steel are stocking up and promise to continue to do so over the balance of the year. Some announcement is awaited daily on wire rod prices. A premature announcement last week, and subsequently not confirmed, stated that wire rods would soon be advanced $2 to $4 a

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ton. Semifinished steel shipments on contracts continue on the basis of $27, Pittsburgh, for rerolling billets, $28 for sheet bars, and 1.70c on skelp. However, on all new business not under contract, producers are quoting $29 for billets, $30 for sheet bars, 1.80c per pound on skelp, and $35 for forging quality billets.

Philadelphia — Most eastern producers of semifinished steel have advanced prices $2 a ton on rerolling billets, sheet bars and skelp. These advances are expected to become general shortly, and may be extended to include other forms of semifinished material.

Steel in Europe

Foreign Steel Prices, Page 76

London—(*By Radio*)—Production of pig iron, steel ingots and castings in Great Britain in October was at approximately the same rate as in September. Pig iron production in October totaled 544,300 gross tons, compared with 529,600 tons in September, a gain of 14,700 tons. The daily rate in October was 17,558 tons, compared with 17,653 tons in September. Active blast furnaces at the end of October were 99, compared with 97 at the end of September. Steel production in October was 907,300 tons, compared with 855,900 tons in September, a gain of 51,400 tons. The daily rate of production in October was 33,603 tons, compared with 34,236 tons in September. The gain in aggregate tonnage was due in both cases to the longer month.

Buying of pig iron is at a slower rate than recently, but furnaces are booked well ahead and an advance in prices may follow the recent increase in the Midlands. All departments of the steel market are active. Exports are gaining slightly, especially to the Dominions and South America. Inquiries for tin plate for export are good but for galvanized sheets are dull.

The Continent reports exports fair, especially to England and the Argentine. Germany reports sales of steel sheets to the Far East.

Metallurgical Coke

Coke Prices, Page 73

By-product coke producers in Pittsburgh are stocking coke to some extent because of mild weather. For metallurgical purposes, Connellsville, Pa., beehive coke remains at $3.55 to $3.75 for standard furnace, $4.60 on common, and $5.75 on premium foundry.

Chicago suppliers are shipping by-product foundry coke in heavier volume than a month ago, at unchanged prices. No change in rate of production and shipments has appeared in the Cincinnati district and demand is broad. Better buying than for any autumn in several years is appearing at St. Louis. At Birmingham, Ala., some reduction in output has resulted from the strike of coal miners.

Nonferrous Metals

Nonferrous Metal Prices, Page 74

New York—Publication of extremely favorable copper statistics for October was the outstanding development in nonferrous metals last week. Lead demand continued active while zinc was featured by a failure to advance in price.

Copper—Total world stocks were cut 35,100 tons last month as consumption increased to the heaviest rate for any month since October, 1929. The effect on sentiment was immediately noticeable and foreign prices firmed with still higher levels predicted.

Lead—Demand held up to large proportions with all sellers easily equalling their ore intakes.

Tin—Undertone of the market was fairly steady compared with the wide fluctuations in the London market. Spot Straits tin was quoted around 53.00c with supplies still scarce.

Trade Bodies Should Draft Social Security Bill

(*Continued from Page* 18)

conditions as may be set up in the plan.

In sharp contrast, note the following salient features of the company reserve plan, of the Wisconsin pattern:

1. Each employer is required to establish a reserve account made up solely of the contributions of such employer. The account belongs to the employer, subject only to the liability of the account for payment of benefits to employes of the employer who have become unemployed. In order to make contributions deductible for federal income tax purposes, the Wisconsin law has recently been changed so that the fund is not recoverable by the employer if he goes out of business;
2. The employer may reduce or discontinue contributions to his account when stated amounts have been accumulated therein; and
3. The state participates only in supervising the proper administration of the system, which under the federal act includes collecting the contributions and depositing them in the federal unemployment trust fund.

The Wisconsin plan might aptly be called "The Steady Employment and Higher Annual Wage Plan." It is based on the theory that true economic security of an individual employe can occur only when his annual pay check is large enough to provide a decent living. Obviously, regu-

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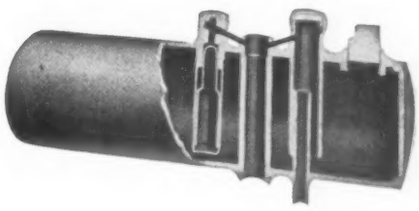

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larity of employment is necessary in producing this result.

From observations made during 15 years of close contact with the management side of industry, I am firmly convinced that there has not been enough employer advertence to the problem of regularization of employment.

The Wisconsin law is designed to create this advertence by supplying a definite selfish tax-saving incentive. This incentive flows from the provision of the law which permits reduction in the rates of contributions when the employer has accumulated specified reserves. Obviously, reserves will not accumulate unless benefit claims are reduced to a minimum. This result can be obtained only through regularization of employment.

"Accident" of Unemployment

If an employer is able to regularize employment to such an extent that he can give all year round employment to his employes, he has made effective the primary purpose of the law.

If, however, through inability or inadvertence to the problem, the employer is not able to supply steady employment, then the secondary purpose of the law, namely, providing higher annual wages for irregular employes, comes into operation.

This purpose is accomplished by the requirement that the employer augment the actual wage of the irregular employment with a deferred wage in the form of limited unemployment benefits.

Thus the Wisconsin law proceeds on the theory that the accident of unemployment is analogous to the accident of bodily injury sustained in industry. Hence, there is placed on an employer the responsibility of either reducing the hazard of unemployment or compensating his employes for the accident of unemployment in the same way that an employer under the workmen's compensation law either eliminates the industrial hazards or compensates his employes for industrial accidents.

Recognizing the fact that unemployment on a state-wide basis is not an insurable risk, and that there is a wide variation in the regularity of employment furnished by different employers, the Wisconsin system affords only limited coverage to the employe but does place the responsibility for that coverage logically upon the individual employer by making him a self-insurer, to a limited degree, of his own accidents of unemployment.

The practical result of the Wisconsin system is that the steady employer is not penalized by subsidizing the irregular employer.

Contrast this result with that obtained under the English or pooled system. Under the pooled system, the regular employer receives no reduction in contributions due to the fact that he furnishes regular employment.

Proponents of the pooled fund system will argue that a pooled fund system may provide for merit rating, that is, reduction in the rate of contributions as a reward for good employment experience.

They are technically correct in this assertion, but let me give you fair warning that no pooled fund system, even though initially containing a merit rating provision, will permanently allow *any* reduction in the rate of contribution by any employer.

I have had too intimate contact with proponents of the pooled fund system not to realize that they are interested only in obtaining as large a fund as possible. The merit rating provision in a pooled fund system would be just a come-on. The company reserve plan, which has for its primary purpose regularization of employment, is the only system which will assure true merit rating.

It seems only fair to point out to this group, which is essentially individualistic in their beliefs and activities, that it would be rather inconsistent for them to support the pooled fund idea, which is definitely socialistic, instead of the Wisconsin plan which is fundamentally individualistic and which follows quite closely the pattern of the voluntary system suggested by the United States Chamber of Commerce.

The importance of regularization of employment has been rather generally acknowledged by employers during the past year. To my mind it is a vital factor in retention of our capitalistic system. If the great majority of our people are regularly employed on an annual basis so that they can be assured of a stable annual wage, we need have little concern that communistic teachings will take root in this country.

Reserve System Not Dole

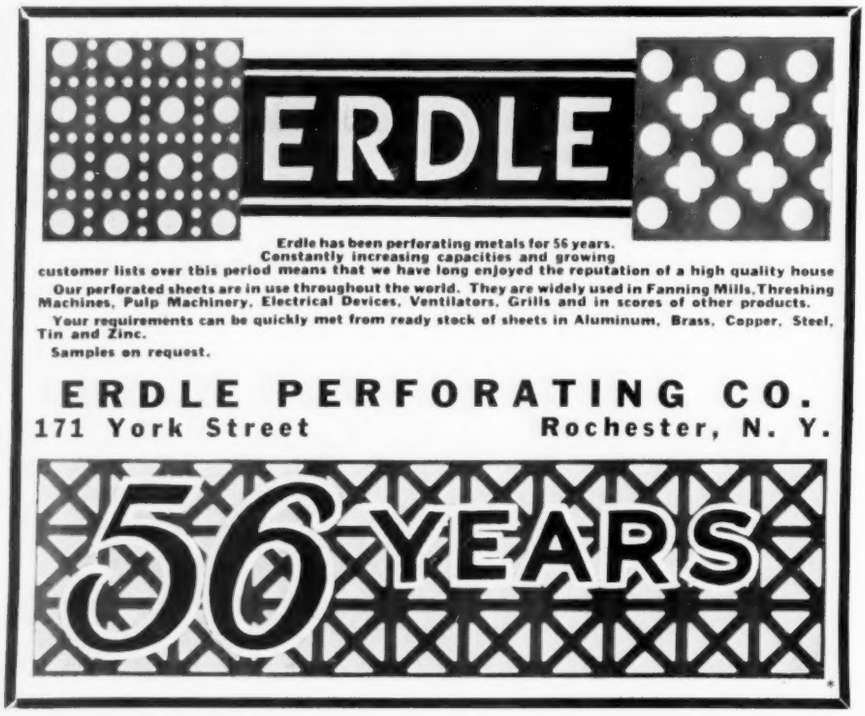
If this viewpoint is correct, then it would seem that every employer should urge the establishment of a company reserve system, the only system which will truly promote regularization of employment rather than the pooled fund system which has for its sole purpose the compensation for idleness.

Now let us assume that the employer has made his decision as to the type of system he prefers. In that event, his work has just begun for he must then do the real job of preparing a plan which will be fair to both the employe and the employer and as administratively simple as possible.

This work should logically be done by the employer's trade association. It is a big job which will require the hiring of experts.

If this group happens to favor the company reserve idea, it is fortunate to have as an active executive, Fred H. Clausen, who by reason of his intimate knowledge of the Wisconsin law is in a position to point out certain phases of a company reserve system which may be handled more advantageously than as set up in the Wisconsin law.

But permit me to point out that employers will have far less difficulty in obtaining a fair and constructive law, if they draft and sponsor a bill than if they try to amend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a bill introduced by those not having their viewpoint. To summarize:

1. The act is a tax measure;
2. Credit against the tax can only be obtained by making contributions under an approved state system;
3. If the employers desire to play safe they should select the type of state system they prefer and sponsor its establishment at least conditionally;
4. To assure the enactment of sound legislation, the employer should prepare the bill for establisment of the state system; and
5. The leading trade associations should assume responsibility for the drafting and sponsoring of the bill.

In closing, let me remind you that I have deliberately presented only a bare outline of the problem in order to arouse employer interest in the problem, on the theory that only through employer interest in and advertence to the problem will a sound solution be obtained.

Equipment

Chicago—Machinery and equipment demand is steady though activity in some lines still is below the late summer rate. Sales of small tools and miscellaneous equipment are holding well, in contrast to the smaller volume of business in machine tools. Orders for the latter usually are for single items. Railroad purchases are few and only an occasional inquiry is appearing from car shops. Deliveries on standard machine tools are improving, shipments of four to five weeks now being available compared with six to eight weeks a month or two ago.

Pittsburgh — Announcement is awaited momentarily in the steel mill equipment trade on the successful bidder to construct the Carnegie-Illinois Steel Corp.'s new 100-inch semicontinuous sheared plate mill at Homestead, Pa. If completion is expected by May 30, 1936, as previously announced, contracts to outside rolling mill builders must be awarded shortly.

New York—Largely for replacement, machine tool buying continues heavy. Purchases are being made by plant executives who have been out of the market for more than five years. The metal fabricating industry is notably active, but the railroads are not adding much to the volume of incoming business. The price situation is strong with an upward tendency. Some shops, notably those producing heavier machinery, cannot make delivery before the first of the year. Demand is mostly for high production units, models developed during the last year or two.

Seattle—Notwithstanding the season, machinery and equipment continue in fair demand. Inquiry from private sources is improved as plant replacements come out definitely. Logging machinery is moving well and there is still a call for mining equipment. Puget Sound navy yard opened bids Nov. 12 for pumps, coolers, meters, batteries, machine tools and other items.

Construction and Enterprise

Michigan

BAY CITY, MICH.—William J. Sovereign will erect a $20,000 oil refining plant on a five-acre tract, near Bay City.

BAY CITY, MICH. — National Electric Welding Machine Co., 1846 Trumbull street, has made an addition to its present plant that will add 4000 square feet of floor space. It will be used for the assembly of machines.

DETROIT—Morse Tool Co., William S. Morse president, has moved to a larger plant at 116 East Goldengate avenue.

DETROIT—Michigan Tool Co. has let contracts for the erection of a new plant adjacent to its present factory on McNichols road. The new building will add some 20,000 square feet to the company's present facilities, and will be used for concentrating all machine tool manufacture.

NORTH MUSKEGON, MICH. — G. E. Dake, Morton Mortensen, and G. H. Weston Jr. filed corporation papers Oct. 8 for Service Machine Works, Inc.

Ohio

CLEVELAND—Schaefer Body Inc., 4180 Lorain avenue, has leased for five years the former Glauber Brass plant at 5009-11 Superior avenue. The new location has 30,000 square feet of space and will be used for body manufacture. The company is spending $10,000 for remodeling.

DAYTON, O.—Air corps, materiel division, contracting officer, Wright field will take bids for universal milling machines Dec. 6.

DAYTON, O.—Air corps, materiel division, contracting officer, Wright field wants bids Nov. 22, circular 36-348, for frequency converter motors.

LAKEWOOD, O.—Perfection Steel Co., 3311 West Seventy-third street is planning to locate in the old Lakewood Engineering Co. plant on Berea road.

TROY, O. — City council has authorized Service Director George L. Smith to advertise for bids for the construction of the water softener and iron removal plant for the city waterworks, as a PWA project.

Illinois

CHICAGO—Jiggers Inc., 2301 North Knox avenue, has been incorporated to deal in all kinds of steel, iron, lead, etc., by Henry H. Porter, Ellis Burrell and George M. Sundheim. Correspondent: George M. Sundheim, 1007 First National Bank building.

CHICAGO—Vapo Systems Equipment Co., 1016 North Dearborn street, has been incorporated to manufacture machinery by C. R. Parks, George C. Flint, and Howard T. Ballard. Correspondent: Howard T. Ballard, Suite 808, 3231 Sulton boulevard.

CHICAGO — Star Refrigeration Service Corp., 16 East Ontario street, general manufacturing, has been incorporated by Frederick J. Avery, Lloyd Spradlin, and William Reeda Jr. Correspondent: Reeda & Peace, 35 East Wacker drive.

CHICAGO, Ill.—Patten Tractor &

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Equipment Co., 431 South Jefferson street, B. C. Patten president, has announced leasing of the Carlson Forging Co. plant at 1056 North Kolmar avenue, with occupancy planned for Dec. 15. Extensive alterations are to be made immediately, and service and parts department facilities will be greatly enlarged.

Connecticut

DANBURY, CONN.—City, C. E. Bemoit, will soon take bids for waterworks, including filtration plant, costing $570,000. PWA grant has been allotted. Fuller & Everett, 22 East Fortieth street, New York, engineer.

HARTFORD, CONN.—Arrow-Hart & Hegeman Co., 103 Hawthorne street, soon lets contract for brick steel factory unit, costing $75,000. Mylchreest & Reynolds, 236 Palm street, architects.

NORWALK, CONN.—City is making plans for waterworks, including pumping units. Cost estimated at $218,000. N. S. Hill Jr., 112 East Nineteenth street, New York, engineer.

Massachusetts

NORTH READING, MASS.—Town board of selectmen, Town hall, will soon take bids on waterworks system, estimated at $229,750. PWA grant of $103,338 has been approved. Whitmand & Grant, 89 Broad street, Boston, engineers.

New York

LARCHMONT, N. Y.—Members of the Westchester council of utility rate committees have filed with the village clerk a petition for a power plant referendum in November. George M. Wagner is secretary of the rate council.

NEW YORK—Scrap Iron Baling Corp. has been incorporated to deal in iron, steel, and junk. Papers were filed by David D. Levinson, 122 East Forty-second street, New York.

NEW YORK—Reliable Steel Sheet Corp. has been incorporated to deal in sheet metal. Papers filed by Maurice Lefkort, 570 Seventh avenue, New York.

NORTH TONAWANDA, N. Y.—National Radiator Corp., Eighth and Ironton streets, will auction machinery and equipment Nov. 19, on the premises. Real estate will be sold in one parcel. Samuel T. Freeman & Co., auctioneers, 1808-10 Chestnut street, Philadelphia.

WATERLOO, N. Y.—A municipal electric plant to serve Seneca Falls and Waterloo has been proposed by officials of both villages, according to Frank Schott, clerk of Waterloo.

New Jersey

CAPE MAY, N. J.—City plans reconstructing sewage pumping plant and constructing and extending outfall line. Cost $60,000. Applied for PWA fund. L. E. Miller, city engineer.

MOORESTOWN, N. J.—Moorestown township plans sanitary trunk sewer and installing pumping equipment. Cost $35,683. PWA funds have been applied for. S. T. Hollinshead is township engineer.

Pennsylvania

PITTSBURGH—Pennsylvania State PWA Administrator Edward N. Jones will act shortly on proposals, including construction of sanitary sewers in eight Pennsylvania township streets, involving about $18,689, and a sanitary sewer in Verona, Pa., $13,549.

TITUSVILLE, PA.—Cyclops Steel Co., has purchased property adjoining its plant, consisting of 7½ acres, and a building containing approximately 75,000 square feet of floor space. Steel buildings will be erected to house new hammers, heating and annealing furnaces, and to provide storage for ingots and billets. The greater portion of the building purchased will afford space for the manufacture of various products, while other portions will be utilized to increase facilities for inspecting, shipping, heat treating, and laboratory departments.

Alabama

BIRMINGHAM, ALA.—Ingalls Iron Works Co. has purchased seven acres on the Tennessee river at Decatur, Ala., on which a permanent boat works is being constructed. The company is at present operating on leased property, having built several tankers, barges, houseboats for United States engineers, and other craft at that point.

Maryland

BALTIMORE — Mutual Chemical Co. of America, 1201 Dock street, plans to erect two metal buildings.

HAMPSTEAD, MD.—City receives bids Nov. 23 for waterworks, including 15,040 feet of mains, with castings, valves, hydrants, tank and tower, pump house, well, and accessories. L. J. Houston Jr., Fredericksburg, Va., is engineer.

District of Columbia

WASHINGTON—Navy department, bureau of supplies and accounts, asks bids Nov. 22, schedule 6422, for pneumatic hoists; schedule 6423, for woodworking lathes, Mare Island.

Kentucky

COVINGTON, KY.—City applied to Kentucky public service commission, Frankfort, Ky., for permission to construct filtration plant. Cost, $850,000.

NEWPORT, KY. — Cave Springs Distillery Corp. engaged Glazier & Morlidge, 305 Walnut street, Cincinnati, engineers, to prepare plans for plant together with power house, machine shop, and other units. Cost $175,000.

Georgia

BRUNSWICK, GA.—City, J. F. Ahern consulting engineer, 2355 Post street, Jacksonville, Fla., receives bids Nov. 27 for a 100-kilowatt diesel power plant complete.

DECATUR, GA.—City, A. F. Newman, receives bids Nov. 22 for constructing 500,000 gallon elevated tank, costing $35,000. W. H. Weaver, city engineer.

FORSYTH, GA.—City receives bids Nov. 22 for waterworks, costing $63,000.

Louisiana

BATON ROUGE, LA. — Baton Rouge Coca Cola Bottling Co. plans installation of electric power equipment, conveyors, etc., in new two-story mechanical bottling works. Cost about $40,000. Work is to begin soon. Norman V. Riviere, Kings Hotel building, Baton Rouge, is the architect.

PONCHATOULA, LA. — Common council plans new municipal electric light and power plant, and cold storage and refrigerating plant. Cost about $125,000. Financing will be arranged through federal aid. W. R. Haight, mayor, is active in project.

Mississippi

STARKVILLE, MISS.—City votes Nov. 25 on issuance of $83,000 bonds for light plant. A. S. Brumby is engineer.

Florida

MIAMI, FLA. — Department of public service, William Sydow director, plans extensions and improvements to municipal incinerator plant, including installation of new steam turbine unit and accessories, boiler, pumping machinery, and other equipment. A fund of $70,900 has been secured through federal aid, and work will start soon.

ORLANDO, FLA.—J. Schnarr & Co. wants prices and data on semi-diesel engine and an A. C. generator, 35 to 50-horsepower.

North Carolina

CHARLOTTE, N. C.—Ciba Corp., 672 Greenwich, New York, plans establishment of a laboratory and distributing warehouse here.

CHARLOTTE, N. C.—Brown & Tingley Inc., has been incorporated, to deal in all kinds of sheet metal material by R. B. Brown, R. O. Tingley, and Nell Norman Tingley.

West Virginia

PARKERSBURG, W. VA.—City, H. R. DeBussey mayor, receives bids Nov. 26 for constructing sewage system for South Parkersburg, costing $141,819. McKinney & Paine, city engineers.

Virginia

BROOKNEAL, VA.—Town, R. D. Williams mayor, J. B. McCrary Engineering Corp., Atlanta, Ga., receives bids Nov. 23 for constructing a sanitary sewer system.

Missouri

ANDERSON, MO. — City plans hydroelectric plant, including turbines, generators, power plant, and complete distribution system; cost, $100,000. Albert C. Moore, consulting engineer, Joplin, Mo.

CARUTHERSVILLE, MO.—City has filed application for a PWA grant of $90,832 and a loan of $111,017 to finance the construction of a municipal light and power plant and distribution system estimated to cost $201,849. If the application is approved the city will issue revenue bonds to cover the amount of the loans.

KANSAS CITY, MO.—John Deere Plow Co., Moline, Ill., has leased a four-story building at the corner of Thirteenth street, Terrace and Hickory streets, in West Bottoms, to be used for storage and shipping facilities.

KANSAS CITY, MO.—Thomas L. Dawson Co., 2035 Washington street, wants prices and data on an electric welding machine, 300 ampere, air compressor with tools, and welder's pipe cutting machine for holding torches in cutting beveled ends.

KEYTESVILLE, MO.—City, W. W.

(*Please turn to Page* 96)

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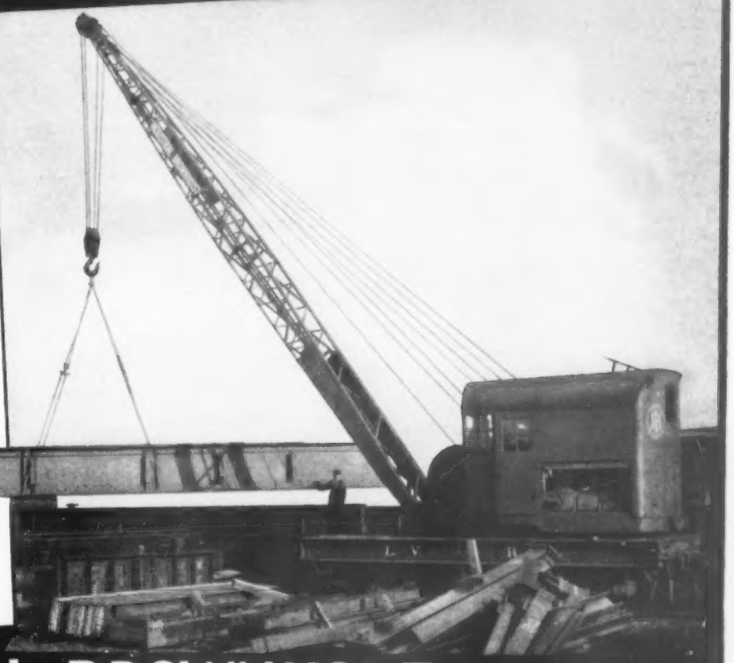

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(Concluded from Page 94)

West mayor, receives bids Nov. 26 for waterworks, including deep well pump, pipe line, and distribution system, to be let in two contracts. Russell & Axon, engineers, 4903 Delmar boulevard, St. Louis.

Arkansas

BATESVILLE, ARK.—City has allotment of $43,000 for sewers; PWA project. W. R. Heagler, Paragould, Ark., is engineer.

OSCEOLA, ARK.—City has PWA allotment of $52,000 for light plant. M. C. Bauman, engineer, West Memphis, Ark.

WEST MEMPHIS, ARK.—City has allotment of $62,000 for sewers; PWA project. M. C. Bauman, engineer, West Memphis.

Oklahoma

COMMERCE, OKLA.—City has completed plans for underpass, sanitary sewers and sewage disposal plant, costing $50,000. Albert C. Moore, Joplin, Mo., is consulting engineer.

ELK CITY, OKLA.—City, Dr. W. H. Lagate mayor, E. T. Archer & Co., engineers, Kansas City, Mo., receives bids Dec. 4 for municipal water supply improvements, consisting of 75,000 feet of 14-inch water line, 3 gas engine pumping units, surface reservoir, pump house, etc.

VINITA, OKLA.—City will soon vote on $750,000 bonds for sewage disposal plant, water works, sanitary sewers, storm sewers, etc. Albert C. Moore, consulting engineer, Joplin, Mo.

WRIGHT CITY, OKLA.—Choctaw Lumber Co., Dierks building, Kansas City, Mo., plans rebuilding burned lumber mill.

Texas

DALLAS, TEX.—Bramblett Mill & Mfg. Co. plant, 136 Jorden street, was damaged by fire on Oct. 25.

HOUSTON, TEX.—L. L. Lankford erecting a saw mill at 4901 Clinton drive, including a 28 x 80 foot mill shed, and a 21 x 100 foot dry kiln. Cost $10,000.

RAYMONDVILLE, TEX. — City commission held an election Nov. 14 to vote on the proposal to issue $125,000 of revenue bonds for the purpose of constructing an electric light and power plant.

YORKTOWN, TEX. — Application for PWA loan and grant of approximately $150,000 for construction of an electric light and power plant and a distribution system has been ordered by the city council.

Wisconsin

MILWAUKEE — North-End Foundry Co., 1818 South Sixty-eighth street, West Allis, suffered loss by fire on Nov. 6. Reinhard Koepsell is vice president.

MILWAUKEE—Milwaukee Flush Valve Co., 301 East Reservoir avenue, has started work on extensive alterations and will install additional production equipment. Julius Judell is president.

MILWAUKEE — Paper Makers Chemical Corp., 5276 North Hopkins street, is preparing to build a 1-story addition, 88 x 212 feet.

MILWAUKEE — Advance Tool & Die Casting Co., 3760 North Holton street, will build an L-shaped addition, 35 by 120 feet, and 20 by 50 feet, one story high.

OSHKOSH, WIS.—Board of vocational education is considering installation of equipment for new cold metal shop, by rearranging machinery in present school. A. Milton Bleyer is director.

WAUPUN, WIS. — Milfound Co., manufacturer of gray iron castings, sustained loss by fire. Decision as to rebuilding awaits loss settlement. William Fleming Jr. is secretary.

Minnesota

OWATONNA, MINN. — Owatonna Tool Co., Rose street, will start an expansion program with erection of a new building on the Kaplan property, adjoining the company's present plant on the west. Considerable manufacturing equipment, including presses and furnaces of the latest types, already has been purchased.

Kansas

MANKATO, KAN. — Common council has plans nearing completion for new municipal electric light and power plant, and electric distribution system. Fund of $111,000 is being arranged through federal aid. E. T. Archer & Co., New England building, Kansas City, Mo., consulting engineers.

Arizona

FLAGSTAFF, ARIZ.—The Arizona Power Co. and the Flagstaff Electric Light Co. have announced that $75,000 will be expended to construct a 400 kilowatt transmission line from the Arizona Power Co.'s hydro-electric plants. Plans include construction of a substation, switchboard, and other equipment.

New Mexico

CORONA, N. MEX.—Application has been filed with PWA for a loan of $20,436 for establishment of a municipal electric plant and distribution system.

GRENVILLE, N. MEX.—Application has been filed with PWA for a loan of $24,565 for establishment of a municipal electric plant and distribution system.

Pacific Coast

LONG BEACH, CALIF. — Fred Tucker, 913 Olive avenue, will build a machine shop at 220 East State street. Plans were prepared by Burt L. Craig, structural engineer, 3759 Brayton avenue. The shop will be 50 x 75 feet.

REDWOOD CITY, CALIF.—General Petroleum Corp., 519 Nineteenth street, Oakland, Calif., plans construction of a steel service station to be erected on Bayshore highway. Cost is $25,000.

RICHMOND, CALIF. — Standard Oil Co. of California, Financial Center building, San Francisco, has authorized plans for new steam-operated electric power plant at the oil refinery in Richmond. Cost close to $1,000,000 with equipment. Stone & Webster Engineering Corp., 49 Federal street, Boston, is consulting engineer.

ROSEBURG, OREG.—Bids will be received Nov. 29 for construction of a sewage system and disposal plant with daily capacity of 2,000,000 gallons.

SAN FRANCISCO—The city and county will ask for bids shortly for the construction of machine shops to be erected at the Marina junior high school, Fillmore street. George Kelham, 315 Montgomery street; W. Day, Financial Center building, and John Bakewell Jr., 251 Kearny street, are the architects. Cost is $233,808.

SAN JOSE, CALIF. — The city council has under consideration a report of City Engineer W. L. Popp on the construction of a municipal water supply and distributing system to replace existing plant of the San Jose waterworks. Estimated cost of constructing new system is $2,960,000, and cost of replacing existing system is $2,700,000.

SOUTH GATE, CALIF.—Pacific Iron Fitting Co., F. Cerny foundry superintendent, 2605 East Twenty-sixth street, Vernon, plans 100 x 250-foot factory on Compton-Jaboneria road, to exceed $28,500. Maturity in January.

THE DALLES, OREG.—Port commission will receive bids Nov. 29 for construction of a $230,000 timber wharf and two warehouses. Specifications also call for cargo equipment, trucks, and mechanical devices.

PORTLAND, OREG. — Logger's Contractors' Machinery Co. is constructing a one-story concrete warehouse and plant at 211 South-east Madison street. Investment with equipment will exceed $50,000.

HOQUIAM, WASH.—City officials are planning an industrial water supply system in anticipation of another pulp plant here.

OLYMPIA, WASH.—State Highway department will receive bids Nov. 26 for erection of five buildings at Vancouver, estimated to cost $152,000, which will include shop, auto service, office, and storage buildings. The same date bids will be opened for building five similar structures at the Wenatchee district headquarters to cost $124,000. The specifications call also for a septic tank, heating plant, and automatic stoker.

SEATTLE — Elmer E. Hemrick Brewery Inc., 619 Alaska building, has been incorporated with capital of $25,000.

SEATTLE—Seattle Gas Co. has prepared plans for construction of a $12,000 pumping house at 2000 Northlake avenue.

SPOKANE—The City has purchased sites for four wells in connection with proposed $330,000 improvement to the south side water system, which will include pump units, motors and mains.

Dominion of Canada

NIAGARA FALLS, ONT.—Workmen are overhauling machinery in the plant of the Aluminum Co. of America. Plant officials express optimism for its reopening in the near future.

Foreign

LONDON, ENGLAND — Richard Thomas & Co., will begin immediately the construction of a large steel plant, costing approximately $50,000,000, and involving complete equipment for production from ore to full-finished sheets and tin plate. A considerable portion of the modern steel mill equipment will be purchased in this country. G. Arthur White, until recently vice president of the Rotary Electric Steel Co., Detroit, will have entire charge of the plant construction.